Report No. _____

Document of
The World Bank

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Democratic Republic of Congo
Growth with Governance
In the Mining Sector

Draft, 19 November 2007

Oil/Gas, Mining and Chemicals Department
AFCC2
Africa Region

Dates
Calendar Year, unless otherwise specified

Weights and Measures
metric, unless otherwise specified

Exchange Rate
Franc Congolese 500 = US$ 1

Abbreviations

ANR	National Security Agency
ASX	Australia Stock Exchange
BCC	Congo Central Bank
BGR	German Federal Institute for Geosciences & Natural Resources
CAFOD	Charitable Organization UK
CAMI	Mining Title Registry and Cadastre Service
CEEC	Diamond and Precious Metals Evaluation Centre
CODELCO	Chile National Copper Company
COPIREP	Steering Committee for Reform of Public Enterprises
CTC	Certified Trade Chain
CTCPM	Technical Unit for Mining Coordination and Planning
DFID	Department for International Development
DGI	Directorate General of Taxes
DGRAD	Directorate General of Dominal and Assises Taxes
DRC	Democratic Republic of Congo
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
EMAK	Miners Exploitation Association of Katanga
EMP	Environmental Management Plan
FARDC	Armed Forces of Democratic Republic of Congo
GDRC	Government of the Democratic Republic of Congo
GÉCAMINES	Générale de Carrières et des Mines
GTL / STL	Groupement de Terrils de Lubumbashi
IMF	International Monetary Fund
KCC	Kamoto Copper Company
KMT	Kingamiambo Musonoi Tailings
KOV	Kamoto East, Olivera and Virgule
KP	Kimberley Process
MIBA	Compagnie Miniere de Bakwanga
MOF	Ministry of Finance
MOM	Ministry of Mines
MOP	Ministry of Planning
MOPORT	Ministry of Portfolio
MPW	Ministry of Public Works
MSR	Ministry of Scientific Research
OCC	Congolese Control Office
OFIDA	Office of Customs and Duties
OKIMO	Office of Mines of Kilomoto
ONATRA	National Transportation Office
PNC	National Congolese Police
PPP	Public Private Partnership

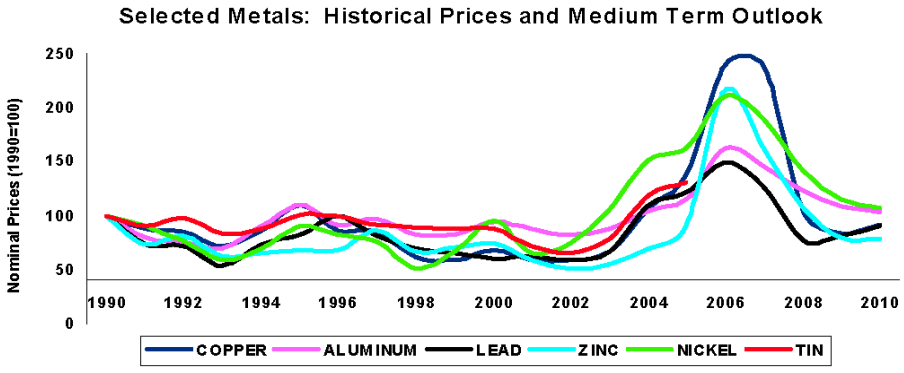
ROSC	Report on Observance of Standards and Codes
SAESSCAM	Assistance Office for Artisanal and Small Scale Miners
SAKIMA	Gold Company of Kivu and Maniema
SNCC	National Railways Company
SNEL	National Electricity Company
SODIMICO	Industrial and Mining Company of Congo
SOMINKI	Kivu Mining Company
SOE	State Owned Enterprise
TSX	Toronto Stock Exchange
UN	United Nations
UNICEF	United Nations Fund for Children
USAID	United States Agency for International Development
USGS	United States Geological Survey
WBG	World Bank Group

Table of Contents

Preface

This study examines the mining sector's potential to contribute to economic growth with governance in the Democratic Republic of Congo. In the past, mining has been the main engine of the Congo economy. But the revenues and other benefit streams generated by the sector over the years have not been used in a wise or sustainable fashion, largely due to key problems with sector governance. During the past ten years of civil war and conflict, flagship industrial mining declined substantially, and informal and artisanal mining expanded significantly. Now that peace has returned to most of the country and a new democratically elected Government is in place, the potential for the mining sector to contribute to economic growth is excellent. However, achieving growth with governance depends on three principal internal and external factors. The first of these, international commodity prices, is largely out of the Government's control. The second factor, political stability, is clearly critical to growth of the sector; however, a detailed discussion of this factor is outside the scope of this study. The third factor, rent-seeking culture, is at the heart of the challenge that the Government must overcome to ensure sustained sector growth with good governance.

World commodity prices. Prices of major non-ferrous metals, gold, and diamonds – DRC's principal mineral export commodities – are set on international markets. For the past three years there has been an extraordinary increase in the prices of these commodities, driven principally by high consumption (in the case of non-ferrous metals) in China, India and other countries and, in the case of gold and diamonds, by strong retail demand. For instance, in 2003 the price of copper, to take the example of one commodity, was around US$1.00 per pound (US$2,200 per metric tonne). The current (May 2007) copper metal price is US$3.30 per pound (US$7,200 per metric tonne). However, prices of mineral commodities are highly cyclical, and predictions of future prices vary enormously. Some observers would suggest that a fundamental shift has occurred in consumption patterns for mineral commodities, which will result in higher prices for the foreseeable future. Others suggest that the present boom in commodity prices is in mid-cycle. This report adopts the conservative view that the current high prices should decline over the coming years, though possibly not to the low levels of the early part of this decade.



Source: World Bank, "Outlook for Metals Prices," September 2006, based on projections from Commodity Research Unit.

The probable future decline and fluctuation of commodity prices has several implications for the mining sector in DRC. First, as commodity prices fall, so too does the amount of investment funding available for minerals exploration and investment. Second, producing companies will generate lower revenues, and the government will have a consequent decline in fiscal receipts. Third, companies will face pressure to maximize their economies of scale, generally by increasing through-put in order to meet fixed costs. At the same time, because of lower sales revenues, companies will be forced to reduce operating costs, often by cutting staff and social services. Fourth, lower commodity prices will have a direct effect on the artisanal producers of mineral commodities whose day-to-day dependence on the amounts earned in the mines renders them highly vulnerable to fluctuations. For example, artisanal producers of coltan were severely impacted by the rapid decline in the price of this commodity (used in cell phones) early in this decade.

Security and political dynamics. Like all post-conflict states, DRC must now rebuild political and administrative systems that were destroyed or severely degraded over the past 10 years. Following the transition period, as mandated in the Sun City accords of 2002, a new government, headed by President Joseph Kabila, was elected at end 2006. However, the political process is extremely fragile, and the new Government has been slow to establish itself. DRC does not have a long history of democratic rule, and officials have much to learn about the art of governing. As administrative systems are rebuilt, therefore, attention must be paid to logistics, personnel, information systems, standards of governance, and responsiveness to the needs of the governed.

It is outside of the purview of this study to examine in detail the dynamics of the political evolution in DRC. However, an open and legitimate political process is a prerequisite for stability and a smoothly functioning administrative system. Such a process is critical for the mining sector, which must attract large amounts of investment capital from local and foreign sources in order to develop and produce mineral resources. It is also critical for the fair and equitable distribution of benefits arising from the sector. The Government faces an enormous challenge of fulfilling the twin mandates of decentralization of powers to the provinces and retrocession of mining taxes. Another major challenge is the need to establish government hegemony over areas of the country that have been governed by warlords, and to rid the artisanal mining areas of predatory militias. However, replacing the militias with equally predatory detachments of the national army will not improve the well-being of the artisans or contribute to sustainable production.

Culture of rent seeking. Throughout its modern history, the people of the Congo have been exploited by slave traders, King Leopold of Belgium, mining companies in colonial times, and, most of all, the kleptocracy of the Mobutu years. Taking inspiration from this history and leadership, a culture of rent seeking, corruption, and impunity are deeply engrained in DRC. Rent seeking takes many forms, including offers or solicitations of bribes and illicit payments to or by government officials; fraudulent declarations to the tax authorities; embezzlement of state funds; conflicts of interest of officials who have an ownership stake in companies doing business with the government; inappropriate use of position to influence government decisions; and others. The pervasive culture of corruption exists at every echelon of Congolese politics and government administrative services. For those lowest in the hierarchy, such as a customs official who has not been paid for months, taking a bribe is a matter of survival. For more senior members of the hierarchy, vast sums are said to find their way to offshore bank accounts or property investments in South Africa, Europe, or elsewhere.

The new Government recognizes this malaise and is committed to "… the struggle against political impunity and immorality which are unfortunately deeply rooted in the political soil of Congo," [1] To address these concerns, in February 2007, the Congolese parliament adopted a Governance Contract, which enumerates the measures the Government will take over the next four years to improve "participation, transparency, responsibility, respect for the primacy of law, efficiency and equity." With reference to the mining sector, the Governance Contract makes specific reference to the effective implementation of the Extractive Industries Transparency Initiative (EITI), in which DRC has participated since March 2005. However, there remain many challenges and much significant work to be done to improve governance in general and the mining sector specifically. It is important to improve governance not only in the moral sense but also in terms of ensuring an efficient, well-functioning, and internationally competitive mining industry. The extra costs of a bribe to a customs official or gift of stock to a senior government official may seem like a tolerable expense in the short term but it leads inevitably to an ever escalating spiral of demands for illicit payments which will ultimately represent a significant competitive disadvantage to the DRC mining sector.

[1] Inauguration address of President Joseph Kabila, December 6, 2006.

Executive Summary

The Democratic Republic of Congo (DRC) is endowed with exceptional mineral resources, and exploitation of these resources holds great promise for jump-starting economic development, as has happened in other countries. For instance, DRC's mining sector could, within ten years, contribute 20-25 percent of GDP and one-third of total tax receipts. However, in the past the DRC has been unable to harness its mineral wealth for economic development, due largely to corrupt management and political interference in the parastatal mining companies, and to inappropriate policies that limited private sector investment. Following the fall of the Mobutu government and the period of civil war, the transitional government has taken some important steps to stimulate development of the sector, including restructuring the parastatals and allowing private sector investment. The most significant step in this direction was the passage in 2002 of a new Mine Law and regulations. This action, together with current high commodity prices, has resulted in a renewal of investment in exploration and exploitation activities. This will not result in a positive economic outcome or improved well-being of the Congolese, however, because the administration of the sector is dysfunctional – handicapped by insufficient institutional capacity, continuing political instability, corruption, and fundamental deficiencies in governance. The Government, with the assistance of donors, private sector companies, and civil society, must undertake a coherent and systematic series of actions to address these issues.

This report proposes such a strategic and comprehensive program, to be carried out over the next five years. The overall objective of the program is to increase the contribution of large and small-scale mining to economic development by addressing key deficiencies in the sector. Its specific objectives and goals include:

- *Increasing mining fiscal receipts* in the short term, by (i) conducting audits of companies and government agencies; (ii) centralizing tax collection and reporting functions within a special cell and a "transitory account" in the Ministry of Finance; and (iii) recruiting an internationally respected firm to build the capacity of the Government to improve tax collection. In addition, the central and provincial governments must address the special issues posed by the constitutionally mandated retrocession of revenues to the provinces.
- *Improving the enabling environment,* by addressing certain gaps in the mining legislation relative to small-scale mining permits, community consultation, and environmental protection. There is also a need for a sliding-scale royalty on minerals production, and for a special fee levied on the transfer of mineral rights.
- *Improving governance of the mining sector,* by (i) adjusting the provisions of certain partnership contracts and improving their supervision; (ii) ensuring due diligence for all future contracts, including competent legal advice and proper valuation of mineral assets; (iii) publishing all contracts and information about the companies and partners involved; (iv) improving disclosure of revenue flows, particularly through diligent and effective implementation of the Extractive Industries Transparency Initiative (EITI); (v) establishing effective systems to trace mineral commodities if technically feasible and economically sound; (vi) conducting tenders for certain mineral properties, as provided for in the Mine Law; and (vii) eliminating potential conflicts of interest by closing loopholes in current regulations that allow civil servants to own stock in, and serve as officers of, mining companies.
- *Building the capacity of supervisory institutions* to (i) improve efficiencies in mineral rights management; (ii) carry out oversight of the sector; (iii) deliver effective

technical assistance and extension services to artisanal miners; (iv) inspect health, safety, and environmental conditions at mine sites; (v) improve the control and valuation of diamonds; (vi) carry out economic and financial analyses of projects; (vii) improve surveillance of the value and volume of mineral exports; and (viii) carry out geological mapping of the country's mineral endowment.

- *Maximizing the contribution of the mineral endowment to the economic development of the country,* by (i) reforming and restructuring the parastatal companies; (ii) reducing the administrative constraints to doing business in DRC; and, (iii) investing substantially in rehabilitation and/or construction of transport and power infrastructure in mineral producing areas.
- *Improving conditions for artisanal and small-scale miners,* by (i) improving security of tenure for artisanal miners, and reducing conflicts between them and larger industrial operations; (ii) distinguishing between artisanal and small-scale mining; (iii) establishing artisanal miners' cooperatives; (iv) enforcing labor, health, safety, and environmental standards; (v) improving the productivity and beneficiation of minerals; and developing alternative livelihoods.
- *Improving environmental and social conditions in mining areas,* by (i) conducting an inventory and risk assessment of environmental legacies; (ii) conducting baseline studies to distinguish private party and public sector responsibilities for environmental liabilities in the context of the partnership contracts; (iii) enforcing compliance with environmental regulations; (iv) developing an environmental awareness program directed toward artisanal miners; (v) ensuring that financial guarantees given by companies for rehabilitation are effectively accounted for; (vi) ensuring effective community consultation; and (vii) providing for a takeover by other entities of the social services which have in the past been provided by state-owned enterprises.

The program would cost an estimated US$ 200 – 400 million depending on the high or medium priority of the actions to be undertaken. The program would be funded through internal government resources, augmented by multilateral and bilateral donors. Further, this report recommends that a special steering group, composed of senior officials of the Congolese Government and selected donor agencies, be established to provide strategic guidance for the program.

Experience in other countries has shown that the mining sector can produce substantial benefit streams, and that these streams can be used to stimulate economic growth and improve the well-being of the population. For this to happen, three conditions in the sector are required: an enabling environment to attract private sector investment, strengthened supervisory institutions, and good governance. The DRC has adopted an enabling environment for the sector which is consistent with international practice. But supervisory institutions are dysfunctional, and standards of good governance for the sector are inadequate. In order to make best use of the benefits streams the sector could produce, these two conditions must be addressed on an urgent basis.

The mining sector in DRC is poised for an extended period of growth. With current high metals prices and the country's excellent geology base, there has been a frenzy of investor interest for the past 24 months. Based on existing minerals production (mostly artisanal), the advanced investment projects underway, and reasonable assumptions about possible new mine development over the next 15 years, scenarios have been constructed to outline the possible economic and fiscal outcomes. Under the base case scenario, the gross production

value of the mining sector will range between US$2 billion and US$2.7 billion annually, and fiscal receipts will range between US$186 million and US$388 million annually, for the period 2008-2017. Under the medium case scenario for the same period these values increase to US$2.7 – 3.8 billion and US$ 244 – 689 million, per year, respectively. For reference, current GDP is estimated at US$ 8.5 billion and total fiscal receipts at US$1.1 billion per year.

The enabling environment, government supervision, and good governance of the mining sector are the most critical issues with respect to growth of the sector and its eventual contribution to economic development. While the Mine Law and Regulations of 2002 are consistent with international best practice, the Government's effective application of the Law is wholly inadequate. The *fiscal regime* applicable to the sector is internationally competitive and would provide a solid basis for generating tax revenues for the state. However, fraudulent practices by companies and government agencies have created a gap of US$35 million of what should be paid versus what is actually recorded as having been received in terms of royalties and surface rents alone. The gap is actually larger if total mining taxes are considered: about US$200 million per annum should be generated by the sector; the Government claims to have received sector taxes in 2005 of US$27 million. Other areas were improved governance is required are clear guidelines for *government equity participation* in mining enterprises, *disclosure* of mining contracts and the particulars of the partners involved, and *conflict of interest* issues with civil servants and political officials owning stock in mining companies or serving as officers of them. Of note are the several initiatives to develop *tracing systems* for mineral commodities with a view to curtailing clandestine exports and certifying production methods. After a period of inaction due to the elections, the Government has reaffirmed its commitment to implement the *Extractive Industries Transparency Initiative* (EITI), and has recently undertaken steps to update the organizational structure of the EITI implementation committee and to reactivate dialogue with private companies and civil society. The central *government institutions* responsible for oversight of the sector are weak and ineffectual, especially the antenna offices in the provinces. These institutions include the Ministry of Mines and its various departments; services attached to other ministries (customs, security), and others. Significant capacity building, training, and logistical support will be required to strengthen the Government's capacity to administer the sector.

State-owned enterprises have been very large industrial miners in DRC, but virtually all of them are moribund and producing a fraction of the production of previous years. This situation is serious not only because it deprives the government of revenues, but also because the companies are no longer providing the same level of social and community services in the areas where they operate. The Government is considering legislation to restructure the state enterprises; the new legislation may favor strategic partnerships, with the private sector operators being the majority shareholders and taking over management of the companies. The success of this process is contingent on an adequate evaluation of the mineral assets of the state-owned companies and a determination of fair market value on a discounted basis. The Government may also wish to consider a tender operation for some of the mineral assets, though this will require thorough preparation and transparent selection of the development partner.

Private sector companies are very active in exploration and exploitation operations, with or without partnership agreements with state-owned companies. It is estimated that private companies and partnerships are spending a total of US$60 million per year on exploration,

which is essential to discover new ore reserves. Many of the partnership contracts, however, were entered into when the state-owned company was under financial distress, and agreed to terms that may not have reflected the fair market value of the mineral assets. In addition, some of the contracting procedures may not have been proper under Congolese law. Finally, some of the contracts provide for transfer of the mineral right which puts into question the state enterprise's ability to recover the right in the event of default by joint venture.

Any government would have a legitimate concern if contracts did not follow proper procedures or if the partners were simply speculating in the equities markets without performing serious work in accordance with the terms of the agreement. Accordingly, in May 2007 the Government set up a commission to reread the mining contracts signed during the period of civil war and the political transition, and identify those that may require modification. The commission has issued its report and recommendations end October 2007. Its recommendations will be transmitted to the Ministry of Mines and, through it, to the Council of Ministers. According to press reports based on a leaked version of the commission's report, 2/3 of the contracts should be renegotiated and 1/3 should be cancelled. There have been concerns expressed relative to inadequate disclosure of the commission's terms of reference, the tight timetable for the commission to finish its work, lack of expert legal advice and independent observers, and repercussions for the credibility and reputation of the Congo in international financial markets, with consequent delays to mobilizing funding for mining projects. The government should proceed to resolve the issues with the contracts in a timely manner and to discuss with the companies in a cooperative fashion whatever adjustments may be necessary to the contracts.

The government announced in September, 2007, the signature of a preliminary agreement with a group of Chinese enterprises, including the Exim Bank of China, for investments in infrastructure in return for access to mineral deposits. The agreement pertains to a first "tranche" of financing of general infrastructure development in Congo in the amount of US$3 billion in return for rights to exploit unspecified mineral deposits which would require an additional financing related to development of the deposits in the amount of US$ 2 billion. More details of the deal, including the mineral deposits and specific infrastructure investments envisaged, have not yet been revealed. Investment in infrastructure and minerals development in DRC of whatever origin or nationality should be welcomed – provided that it is done on a transparent basis, respects the Mine Law of 2002, does not violate the rights of existing mineral rights holders or agreements which the government may have with other parties, and could result in net benefits streams for the nation and communities where the mine will operate. The preliminary agreement with the Chinese companies raises several concerns including the possibility of tax exemptions and incentives which would be contrary to the provisions of the Mine Law or best practice in the industry. There are also concerns that the financial arrangements may involve explicit or implicit government guarantees of non-concessional debt which would be a violation of agreements with the international donor community. Finally, the negotiations for the agreement have been conducted on a noon-transparent basis and full disclosure of the terms and conditions of the arrangements has been inadequate.

The *artisanal and small-scale mining sector* is the most important segment of the mining sector, not only because it produces the highest volume of mineral commodities, but also because of the people dependent on artisanal mining. There are an estimated 10 million people, 16 percent of DRC's population, who either mine directly or are dependent on artisanal mining for their livelihood. Artisans are present in the production of virtually all

mineral commodities: gold in Ituri province, diamonds in the two Kasais, copper and cobalt in Katanga, and cassiterite/coltan in the Kivus. The artisanal sector presents several challenges for the Government that are distinct from those in other segments of the mining sector. First, there is significant potential for conflicts between artisans who occupy concession areas that industrial companies wish to develop and for which the companies hold the legal mineral rights. Second, vulnerable population groups such as women and children are present in the artisans' camps and are frequently victimized. Third, the artisans have no adequate safeguards with respect to health, safety, security, and environmental protection. Fourth, artisans are frequently subjected to extortionist behavior by government officials as well as criminal elements. An adequate system to guarantee the artisanal miner's legal rights does not exist, nor has the Government established the special artisanal mining zones provided for in the Mine Law of 2002. Fifth, to mobilize finance for artisanal mining, the artisan is frequently indentured to middlemen and financiers who, while playing a legitimate and valuable role in the sector, often charge usurious rates or fail to give full market value for the minerals produced. Sixth, the government agencies responsible for assisting small-scale mining are ineffective, due to difficulties in training, funding, and logistics. Finally, some artisanal mining areas are under the control of various warlords, local militias, or the Congolese National Army, especially in the east of the country. Various reports, notably from the UN Panel of Experts, have stated that minerals are used to acquire arms for these groups as well as to finance other illicit activities.

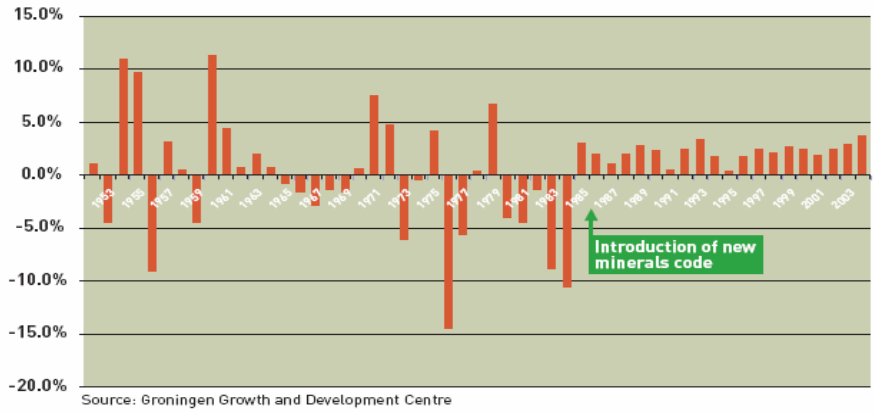
Social and environmental conditions in the sector are deplorable. Social services, which had been provided to local communities by state-owned enterprises, are jeopardized by the financial difficulties of the enterprises. Other industrial mining companies have tenuous relations with local communities, though some are working with outside groups to improve their performance. Consultations with local communities, while required by the Mine Law, rarely take place. In addition, there are numerous legacy environment issues in the main mining areas, especially Katanga. Some of these, such as waste dumps and tailings facilities, could pose a danger to nearby populations. The Government does not have adequate environmental regulations and, even if it did, does not have the capacity to enforce them. Finally, there are allegations that a number of furnaces and processing plants in Katanga are polluting the water supply for the City of Lubumbashi.

1. Mining: Scenarios for Growth

Mining Growth and Poverty Reduction

Mining contributes to economic development and the reduction of poverty. In many countries – Chile, Argentina, Botswana, Ghana, Tanzania, South Africa, Australia, and Canada, for example – the mining sector is an important contributor to the national and regional economies. Recent studies[2] by the International Council for Mining and Metals have confirmed the ability of the mining sector to jump start the process of economic development. The case of Ghana is illustrative. The passage in that country of new minerals legislation in the late 1980s enabled private sector investment in the mining sector. The production of mineral products in Ghana, particularly gold, expanded rapidly in the mid-1990s and was an important stimulus to improved GDP per capita growth in comparison to previous periods. However, translating the growth of minerals production and the revenue streams into measurable improvements in well-being of the population is the ultimate challenge for governments. In the case of Ghana, improvements in the health and well-being of the population in the mining areas are measurable, but these improvements have taken time and a critical mass of multiple mining operations.[3]

Figure 1: Ghana Per Capita Growth Rates: 1950 – 2003 (PPP 1990$)



Source: Groningen Growth and Development Centre

Using the benefit streams from the mining sector wisely to improve well-being of the population also does not happen automatically. Many countries fail to make best use of the benefit streams provided by the extractive industries. Unfortunately, the Democratic Republic of Congo is among these countries. This is in spite of the fact that DRC has a long tradition of mining and a critical mass of operations in a number of metallic and non-metallic minerals. The Extractive Industries Review[4] (EIR) commissioned by the World Bank in 2004, determined that the extractive industries can contribute to economic development – but

[2] See, for example, *The Challenge of Mineral Wealth*, International Council for Mining and Metals, Resource Endowment Series, 2006.

[3] Another example is the case of the Selebe Phikwe nickel mine in Botswana. This mine has been in continuous operation for 40 years, and the well-being indicators for the community and surrounding areas are superior to those of the nation as a whole. See Jan Issaksen, *Economic Benefits Streams from Selebe Phikwe and Tsumeb,* Cristian Michelson Institute, Bergen, Norway, 2006.

[4] World Bank, *Extractive Industries Review* and *Management Response to the EIR*, 2004, www.worldbank.org.

only if the right conditions are in place. These include general conditions such as political stability and peace, application on a consistent basis of sound principles of macroeconomic management, and exogenous factors such as favorable external markets.

There are three other conditions that apply specifically to the mining sector. First, an internationally competitive enabling environment – the ensemble of legal, regulatory, and taxation conditions – is required to attract private sector investment. At the same time, the enabling environment should provide the basis for the government to capture a fair share of the rents that the mineral deposits produce. Second, the government needs to effectively and efficiently enforce the laws, regulations, and tax requirements applicable to the sector. This means that supervisory institutions should possess the mandate and authority to enforce the laws, adequate logistical and funding support, trained and motivated staff, and internal procedures that ensure fair and transparent dealings with stakeholders. Third, the fundamental principles of good governance – transparency, disclosure, and accountability – need to be observed by government officials, companies, and civil society. DRC has been reasonably successful in adopting laws and regulations to improve the enabling environment for the mining sector. However, it has been less successful in improving government capacity to implement these regulations and in promoting the principles of good governance.

The mining sector has been the key sector of the DRC economy since colonial times, contributing between 70 and 80 percent of export earnings and around 8 percent of GDP. Since the early 1990s, however, the industrial production of minerals has declined substantially, the result of civil war, mismanagement of state-owned enterprises, and a downturn in international commodity prices. The decline of the large industrial producers has had significant repercussions not only on the national economy, but also on the provinces and the communities where the enterprises are located. In particular, the companies have been unable to maintain their previous level of support for various infrastructure and social support activities in the communities.

As DRC's industrial sector has declined, the artisanal mining sector has expanded. Estimates vary, but as many as ten million Congolese depend directly or indirectly on artisanal mining for their livelihood. Artisans currently produce an estimated 90 percent of the minerals exported but they do so under very difficult safety, health, and security conditions. In spite of these conditions, given the present high commodity prices and the lack of alternative livelihoods, the artisanal subsector will continue to dominate the production of minerals. However, over the next five to ten years the industrial mining sector will expand substantially. A number of projects are either under construction or in the advanced planning stages, which could come on-stream by 2012. The rebirth of industrial production has been made possible by the new Mine Law of 2002, which opened the country to private sector investment in exploration and exploitation operations. We examine below scenarios of how this growth may take place over the next ten years.

Macro Growth Scenarios

On the basis of projects under construction and in the advanced planning stage, minerals production in DRC could achieve US$ 2-3 billion in value within the next 5-10 years. This will produce significant tax revenues for the government, on the order of US$200-400 million, or 20-40 percent of current tax revenues from all sources.

In this study, we have constructed low, medium, and high-growth scenarios for the Congolese mining sector. Scenarios are not predictions of the future; rather, they allow us to estimate ranges of possible outcomes given a set of conditions which are both plausible and reasonable.[5]

The scenarios combine the production from existing producers, as it is expected to evolve, and from new industrial mines which will come on-stream during the next ten years. The existing production includes that of state-owned companies such as MIBA and GÉCAMINES, as well as artisanal production. It is assumed that over the course of the projection period, small improvements will be made in the assessment and collection of taxes from the state producers and artisanal miners. The scenarios also use models of new industrial copper/cobalt, diamond, and gold mines to estimate future production volumes and values as well as derived fiscal flows. The models have been constructed using the best information available to the study team, including actual and staff estimates of current production volumes and values, estimates of production and values from other organizations and studies, information made available by companies currently operating in DRC, published feasibility studies of companies investing in DRC, government data, international trade statistics, and international comparators as to investment costs, DRC tax parameters, operating costs, and price data.[6] In each instance, the data have been compared to international standards by Bank staff. Finally, the scenarios concern only the mining sector, not oil and gas.

Base case growth scenario assumes (i) the current artisanal production as well as existing industrial or semi-industrial production of mineral commodities by mining companies and/or beneficiation operations and/or trading houses, plus (ii) 3 new copper mines and 1 new gold mine.

Medium growth scenario assumes (i) the low growth scenario, plus (ii) 1 copper mine, 2 gold mines, 1 industrial diamond mine.

Speculative growth scenario assumes (i) medium growth scenario, plus (ii) 2 copper mines and (iii) 1 industrial diamond mine.

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[5] The scenarios contain forward-looking information that is based on our estimates and currently available information. Such forward-looking information involves known and unknown risks, uncertainties, and other factors that could cause actual events or results to differ materially from estimated or anticipated events or results implied or expressed in such forward-looking statements. Factors that could cause such differences include changes in world commodities markets and equity markets, political developments in the Democratic Republic of the Congo, changes to regulations, and the other risks involved in the mineral industry. Prospective scenarios are not guarantees of future performance and, accordingly, undue reliance should not be put on such information due to the inherent uncertainty therein.

[6] Projects modeled include KMT, Tenke Fungurume, Kamoto, KOV, KCC, a diamond mine, and a gold mine.

Obviously, as noted above, a key exogenous factor which will affect the development of the sector is international prices for the commodities that DRC is producing or can produce. We have adopted a conservative posture on the prices used to construct the scenario, in recognition of the fact that prices could return from present exceptional highs to more historically sustainable levels. For instance, in our basic scenario we use a price for copper metal of US$1.10 per pound (US$2,500 per metric tonne). This is the price used generally by the feasibility studies for various projects which have been made available to us. It is recognized, however, that the long-term price could actually remain much higher, for instance US$1.50 per pound (US$3,300 per metric tonne). As a general rule, the estimated values for production and benefits streams would increase by an amount that corresponds to the percentage increase in prices. For instance, if the copper price were to increase by 35 percent (from US$1.10 to US$1.50 per pound) the estimates of values of production and benefits streams would be correspondingly increased.

We have not calculated separately the sector's contribution to GDP, value added, export earnings,[7] or other economic comparators over the projection period. Rather, we include the following estimates of GDP and total government fiscal receipts per annum for reference:

- DRC GDP (2005) = US$ 8,500 million
- Total government fiscal receipts = US$ 1,100 million[8]

Table 1. Contributions from the Mining Sector
averages per annum for each period

Scenarios	2008-2012	2013-2017
Base Case Scenario		
Gross production value, US$ million	1,932	2,676
Government fiscal receipts, US$ million	186	388
Medium Growth Scenario		
Gross production value, US$ million	2,651	3,792
Government fiscal receipts, US$ million	244	689
Speculative Growth Scenario		
Gross production value, US$ million	2,741	5,056
Government fiscal receipts, US$ million	246	734

Government receipts from the mining sector are estimated to average about 10 percent of gross sector revenues for the next five years if the right systems and structures are put in place for revenue collection and for the supervision and control of mineral exploitation. The receipts will increase to about 15 percent of gross sector revenues over the next decade, and to between 15 and 20 percent of gross revenues in fifteen years. The growth of government revenues from the mining sector is dependent on the maturity of the exploitation. Typically, for a new mine, operating revenues for the first five years are directed toward the amortization of capital investments and pay-down of debt. During this early period, the enterprise royalties

[7] The total production values may be considered a reasonable proxy for export values, since little production is consumed locally.

[8] This figure includes tax receipts from the petroleum sector. If these receipts are excluded, the tax receipts from the mining sector and all other sources would be US$850 million.

represent the main income for the government, since the enterprise may not be paying profit-related taxes. After about the first five years, when the enterprise is reporting profits, income taxes, dividends to the State by virtue of its obligatory 5% shareholding and withholding taxes on dividends will represent a higher proportion of government income.

These projected revenues do not include additional royalties and/or dividends that the state-owned enterprises are expected to collect from their joint venture partners. The shareholdings and/or overriding royalties accruing to the SOEs vary according to the partnership agreement. For instance, shareholdings in the exploitation companies set up under the GÉCAMINES partnership contracts vary between 12.5- 17.5 percent in most cases. These shareholdings would typically attract dividends once the company is in profitable operation. Also, the projections do not include the dividend streams that may accrue to the central government by virtue of its 5 percent shareholdings in exploitation companies, as required in the Mine Law. Finally, the anticipated taxes do not include surface rents paid to hold mineral rights, which can be substantial, or other fees and administrative levies to obtain licenses or various authorizations (as, for instance, to open and maintain a *comptoir* for diamond purchasing).

The anticipated fiscal revenues to be generated vary considerably by province, depending on its mineral resource endowment as well as current exploration and exploitation activities. The main provinces used for constructing the scenarios were Katanga, the two Kasais, and Ituri. Some comparatively minor production and fiscal receipts are also generated in the Kivus. The estimated tax revenues for each province take into account the existing, mainly artisanal, production in the province as it will evolve during the projection period. The issue of provincial distribution of fiscal receipts is of particular importance given the mandated retrocession of revenues which will take place over the coming years.

Table 2. Anticipated Mining Fiscal Receipts
selected provinces
US$ millions annual average

Province	**2008-2012**			**2013-2017**		
	Base	Medium	Speculative	Base	Medium	Speculative
Katanga	127	168	170	265	473	505
Kasais	43	54	55	90	149	158
Ituri	15	21	21	35	65	69
Totals	185	242	245	390	687	733

Source: Bank Staff estimates

Description of the Mining Sector

The 2.3 million square kilometers of the national territory contain more than 1,100 different mineral substances. Four main regions – Katanga, the two Kasaïs, Northeast Congo, and Kivu-Maniema – contain most of the known mineralization. However, other provinces also have mineral occurrences and/or potential, much of which has not yet been explored. Known mineral resources in the country's 10 provinces are detailed in Table 3.

Copper, Cobalt, Zinc, Uranium, Germanium

The Copper Belt of Katanga province contains world-class resources of copper, cobalt, zinc, and uranium. From the beginning of mining around 1900 until 2003, a total of 18 million metric tonnes of copper metal was produced, as well as 0.5 million metric tonnes of cobalt,

3.6 metric tonnes of zinc, and 0.28 million metric tonnes of germanium. Annual copper production peaked in 1982 at 542,000 metric tonnes. However, in 2005, officially recorded copper exports from industrial and artisanal sources were 27,925 tonnes of copper metal and

Table 3. Mineral Endowments by Province

Province	Minerals
Bandundu	Diamonds, gold, petroleum
Bas Congo	Bauxite, oil shales, limestones, phosphates, vanadium, diamonds, gold
Equateur	Iron, copper and associates, gold, diamonds
Orientale	Gold, diamonds, iron
Kasai Oriental	Diamonds, iron, silver, nickel, tin
Kasai Occidental	Diamonds, gold, manganese, chrome, nickel
Katanga	Copper and associates, cobalt, manganese, limestone, uranium, coal
North Kivu	Gold, niobium, tantalite, cassiterite, beryl, tungsten, monzanite
South Kivu	Gold, niobium, tantalite, cassiterite, sapphire
Maniema	Tin, diamonds, cassiterite, coltan

177,310 copper concentrates. Cobalt exports were 17,770 metric tonnes of cobalt and 84,835 metric tonnes of cobalt concentrates.[9] With new joint ventures between GÉCAMINES and private industrial mining companies, as well as copper and cobalt mined by artisanal miners, the production of copper metal or copper metal equivalent contained in concentrates could reach 300,000 metric tonnes per year by 2010. The latest statistics indicate that 325 mining companies are active in Katanga province, of which ten are traded on international stock exchanges. For this reason, Katanga should be at the forefront of the reform initiatives to be undertaken by the Government.

Katanga has a substantial reserve base of non-ferrous metals. Identified resources in the Copper Belt are estimated at 70 million metric tonnes of copper, 5 million metric tonnes of cobalt (the world's largest known cobalt reserves), and 6 million metric tonnes of zinc (three percent of world reserves).[10] The copper reserves make the Katanga Copper Belt the second richest copper region in the world, just below Chile.[11] However, it should also be recognized that the size, in tonnage terms, of individual copper deposits in Katanga is smaller than copper deposits in other countries. This has implications for attracting companies for investment, since the largest multinational mining companies are generally more interested in very large tonnage deposits. In the Bas Congo province several copper-rich veins (sometimes with lead and zinc) and rich massive copper oxides are known to be present within the limestone. The deposits are small, but at today's copper prices, one or two can be considered economic.

[9] Report on Katanga mineral exports, compiled from official export statistics of the OCC (Office Congolais de Contrôle).

[10] The Kipushi ore body, owned by GECAMINES is one of the largest zinc-copper-germanium deposits in the world, with 5 million metric tonnes of zinc. This mine has been on a care-and-maintenance basis since the early 1990s, and very little is currently produced. However, following an international tender, the rehabilitation of Kipushi mine was awarded to United Resources (Switzerland) in 2006. Also, the Big Hill cobalt and zinc deposit, with 1.2 million metric tonnes of zinc and 4 million tonnes of cobalt, is currently under exploitation by a joint venture among GECAMINES, George Forrest International, and Outokumpo (Finland).

[11] Philip Crowson, *Minerals Handbook,* 2001, Macmillan. The Chile reserves are estimated to be 90 million tonnes.

Between 1950 and 1980, while the Kipushi deposit was worked at full capacity, the DRC was the world's largest germanium producer. Being a byproduct of zinc production, the old mine tailings and heaps still contain a considerable amount of the metal.

The Shinkolobwe[12] uranium mine, also in Katanga, is now closed; however, the uranium resources remain attractive. Uranium mineralization is also present within some of the Katanga copper-cobalt ores which could be commercially exploitable given the right market conditions. Interestingly, the varying background radiation levels of these ores are currently being researched as a means to trace the ores to producing sites.

Diamonds

In the provinces of Kasaï Occidental and Kasaï Oriental, diamonds are mined from alluvial and detritique (detrial) deposits as well as kimberlitic pipes, but only a relatively small proportion (5 percent) of the diamonds are of gem quality. Diamonds are also found in Katanga, Kivu, and in the north of the country adjacent to the Central Africa Republic. In terms of carats, DRC has the largest known diamond resources in the world – approximately 150 million carats, or 25 percent of the total world known reserves. The potential of finding more diamond reserves is unknown, but estimates by the United States Geological Survey suggest that 500 million carats could be found in DRC. However, in terms of value, DRC's deposits come after Botswana and Russia because its industrial quality stones do not command the highest prices. While 5 to 8 percent of the production at Mbuji Mayi is gemstone quality, the artisanal production around Tshikapa and Kananga is said to be of far higher quality. Artisanal production of diamonds accounts for 75 percent of DRC's total production in terms of carats, and 62.5 percent in terms of value. More than 60 mining enterprises are active in Kasai Oriental, of which five are in partnership agreements with MIBA.

Gold

Rich deposits of gold have been exploited in the districts of Kilo and Moto, both located in the Ituri region of Orientale Province. There has also been active gold exploitation Kivu and Maniema provinces, which still contain world class gold deposits. In the Copper Belt, gold (together with platinum and palladium) has been recovered from the copper blister refinery. The geological context of gold in the northeast Congo is very similar to other Precambrian gold-rich regions in the world. The Moto district has estimated resources of approximately 500 tons of gold. In the Kilo district, the resources are difficult to estimate, but are assumed to be of much higher grades than those in the Moto district. In the provinces of Kivu and Maniema, the existing and identified resources and grades are sufficient for several open pit operations. The three major industrial gold deposits currently being considered for exploitation contain approximately 850 tonnes of gold in all resource categories.

Cassiterite, Coltan, and Other Minerals

Other minerals include alluvial as well as primary deposits of cassiterite, tantalite, columbite (coltan), and wolframite in the eastern part of the country (the Kivus, Maniema and northern Katanga). There are also several ultramafic bodies, though they have not been systematically explored for their nickel and platinum group metals (PGM) potential. Occurrences of platinum nuggets in the heavy mineral concentrates during gold exploration have been reported in several regions, principally in the Kivu province. Finally, the huge sedimentary

[12] The Shinkolobwe uranium mine is exploited by numerous artisans, in violation of the law and at considerable risk to their health and safety.

Congo Basin (*Cuvette Centrale*) has been drilled to a very limited extent for oil potential. Interesting oil shales have been intersected, and the *Cuvette* remains potentially open to further exploration. Research also needs to be conducted on the methane deposits in Lake Kivu and possibly other Congolese lakes. Some preliminary research on the Rwanda side of Lake Kivu would indicate that the layer of methane gas at the bottom of the lake could be used for energy generation. Finally, the country is rich in various quarry materials such as limestone, as well as general construction materials. Formally recognized mining companies are not active in exploitation of minerals in the eastern part of the country; most exploitation and export operations are of a small-scale or artisanal nature.

2. Enabling Environment, Supervision and Good Governance

Early in its tenure, the transitional Government decided that the role of the State in the mining sector would be that of regulator rather than operator, and the newly elected Government has confirmed this decision. This change in roles represents a fundamental paradigm shift. Previously, the sector had been dominated by public enterprises, and private sector development of mineral resources was limited. Under the new policy, primacy will be given to attracting private rather than public investment in the mining sector. Experience in other countries has shown that appropriate conditions need to be in place in order to attract private sector investment and to make best use of the benefits streams which the sector generates. As noted above, these conditions include an enabling environment consistent with international standards; effective enforcement of the laws, regulations, and taxes by the supervisory institutions; and full disclosure, transparency, and accountability by government, companies, and civil society. This chapter will examine how these conditions are being observed in DRC.

The Enabling Environment

The Mine Law 2002, mining regulations, and tax regime in DRC are consistent with international standards, and provide the basis for transparent and sustainable development of the country's mineral resources.

Mineral Rights

According the Mining Law of 1981, mineral rights could only be obtained by private parties, subject to a partnership agreement with a state-owned enterprise or a special agreement with the State. To the extent that land for exploration and/or exploitation is available, the new Mine Law of 2002 allows private parties to access such rights directly, without being required to have a partnership or special mining agreement.

Exploration permits, valid for five years (four years for precious stones), renewable, are available on a first come, first served basis to juridical and physical persons possessing requisite financial and technical qualifications. A maximum of 20,000 km^2 may be held under exploration permits by a single entity. There are at present (September 2007) 4,353 exploration permits, 471 exploitation permits, 59 small scale mining permits and 476 other permits / authorizations in force in DRC. Of this numbers, 4,246 exploration permits are held by private sector companies without a contract with a state-owned enterprise. To obtain an exploration permit, the company is required to present proof of financial and technical competence, as well as a work plan for the initial period of the permit. Furthermore, the company is required to submit regular reports to the Ministry of Mines on the progress and status of exploration work. The Ministry is required to inspect and monitor the work performed and the company's compliance with applicable safety and environmental regulations. Bank staff estimate that more than US$60 million per year is being spent by private companies on exploration in DRC, either on a freestanding basis or in association with a state-owned enterprise.

Table 4. Comparison of DRC Mining Legislation with Other Mineral Producing Countries

Principle	DRC	Argentina	South Africa	Indonesia
Ownership of Minerals	State	State	State	State
Limitations on government discretionary powers in granting of exploration and exploitation permits	Yes	Yes	Yes	Yes
Specification of the duties, competencies, and mandates of government agencies	Yes	Yes	Yes	Yes
Establishment of an independent mine title registry service or cadastre	Central	Provincial	Central	Central
First come, first served permit issuance	Yes	Yes	Yes	Yes
Ability to tender mineral properties held by parastatals	Yes	Yes	NA	NA
Clear and consistent criteria for issuance of mineral rights[13]	Yes	Yes	Yes	Yes
Security of tenure, exclusivity, and non-discrimination[14]	Yes	Yes	Yes	Yes
Payment of escalating surface rents to hold mineral rights	Yes	Yes	Yes	Yes
Possibilities to transfer or cede a mineral right with a minimum of formalities	Yes	Yes	Yes	Contract
Distinction between large and small-scale mineral operations	Yes	No	Yes[15]	NA
Special provisions for artisanal miners	Yes	No	Yes	NA
Requirements for protection of the environment	Yes	Yes	Yes	Yes
Mining contracts or development agreements between parastatals and companies	Yes	Yes	NA	Contract of work
Specification of sector taxation	Yes	Partially	No	Contract of work

Exploitation permits are granted for specified minerals for a period of 30 or more years. The Mine Law (Article 71) requires that the State be granted 5 percent of the shares of the exploiting company free of charge and on a non-dilutable basis. To date, 471 exploitation permits have been issued by CAMI 166 of them to private companies not subject to a partnership agreement with a state-owned company. Exploitation permits derive from exploration permits, are issued to private companies under tests of financial and technical competence, and carry the obligations to reduce the surface area of the original exploration permit. Further, there are requirements for submission and approval of feasibility studies, environmental impact statements, and management plans. Pursuant to the passage of the new

[13] Generally, publicly disclosed minimum thresholds for financial and technical competence, as well as a proposed a work program.
[14] Clear legal standing of mining title; exclusivity with respect to surface area, minerals, and progression from exploration to exploitation; and non-discrimination in terms of local, foreign, large, small investors.
[15] Government policy mandates special provisions for historically disadvantaged groups.

Mine Law in 2002, mineral rights subject to existing partnership agreements (as per the previous Mining Law of 1981) at the time of promulgation of the Mine Law were automatically extended, provided that the parties validated such agreements under the new Law.

Processing permits. The Mine Law of 2002 provides for special permits to process tailings and mining wastes. For example, the proposed operations of Kingamiambo Musonoi Tailings[16] (KMT) will process wastes at a tailings facility in Kolwezi.

Small-scale and artisanal mineral rights. The Mine Law of 2002 provides for small-scale mining permits and for the establishment of artisanal mining zones. A small-scale mining permit is granted for 10 years, and artisans require a "diggers" card authorized by the Law and granted through the provincial authorities. The modalities and difficulties with these permits are examined in the chapter on artisanal mining.

Trading operator permits. Many companies in DRC are engaged in the trade and export of mineral commodities. There are requirements in the Mine Law for these trading companies *(comptoirs d'achat)* to be licensed; to date, more than 100 such licenses issued.

Taxation of the Mining Sector

The tax regime applicable to the mining sector, defined in Title IX of the Mine Law of 2002, is internationally competitive and reflects current best practice. The regime is straightforward and includes the following categories of taxes, which are assessed by different government services according to the mineral commodity:

- Royalties: 0.5 percent ferrous metals, 2 percent non-ferrous metals, 2.5 percent precious metals, 4 percent precious stones, 1 percent industrial minerals, 0 percent on construction materials
- Income tax: 30 percent of imposable income
- Tax on dividends and other indirect income: 10-20 percent
- Customs duties on importation: 2-5 percent of CIF value
- Turnover tax: 3-5 percent on interior services of products
- Tax on rental income: 22 percent
- Expatriate employee tax: 10 percent of salary
- Surface rents due on mineral rights: US$0.02 to US$0.08 per hectare for exploration, and US$5.00 per hectare for exploitation (US$8.00 per hectare for tailings)
- Taxes on land and built-up property at the common rate
- Taxes on vehicles and road traffic at the common rate
- Mineral products (except diamonds) exempt from customs duties upon export
- Fees for services rendered on exports not to exceed 1 percent of value

In addition to taxes levied on operations in the sector, there are numerous fees and other payments for services required under the regulations. The inter-ministerial *arête* issued on August 9, 2007 by the Ministry of Mines lists 46 separate fees, expenses, and levies which

[16] The KMT project was originally to be undertaken by Adastra Minerals in association with Gecamines. Adastra Minerals was acquired in 2006 by First Quantum minerals, which is now the joint venture partner of Gecamines in the project.

attach to various administrative authorizations and licenses. The Government may wish to consider simplifying and in some cases lowering these fees and expenses so as not to discourage operators from obtaining proper authorizations.

Effective rate of taxation. A commonly used reference to calculate the total predicted tax burden on an enterprise or mining operation is the expected effective rate of taxation (ETR).[17] If the tax regime in DRC is applied to an individual project, the ETR would be around 46 percent of the project's pre-tax cash-flow. The expected ETR places DRC in the upper mid-range as compared to ETRs of other mineral producing countries, and within the ranges of ETRs on worldwide income for major mining companies.

Table 5. Effective Tax Rates: Comparison of Countries and Companies

Expected ETR, Selected Countries		**Actual worldwide ETR, Selected Companies**	
Country	**ETR %**	**Company**	**ETR %**
DRC	46	Alcoa, USA	31
Argentina	40	AngloGold, UK	32
Canada (Ontario)	64	BHP Billiton	36
Chile	42	Cameco, Canada	47
Indonesia	49	Freeport McMoRan, USA	55
Mexico	50		
Papua New Guinea	58		
Philippines	45		
South Africa	45		
Western Australia	36		
Source: Jim Otto, Global Mining Tax Study, Colorado School of Mines, 2003.		Source: PriceWaterhouseCoopers, Annual Survey of Effective Rates Comparison, 2002.	

There is, however, often a large disparity between the predicted taxes that should be paid by a project and what is actually paid. This is the result of several factors. All multi-national companies manage their tax liabilities on a worldwide basis. This may result in lower effective taxes paid for an individual project in a particular country, since companies will average the taxes they owe among various projects. Within a country and for an individual project, companies also have legitimate and lawful means of reducing effective tax liabilities from those expected in theory, because of investment credit allowances, depletion and depreciation allowances, ring fencing, exploration allowances, and other mechanisms. There is nothing illegal or wrong with these practices, provided that the companies fully comply with applicable local laws and international accounting practices. Some projects minimize tax liability via transfer pricing mechanisms (e.g., mineral product is exported from DRC and sold outside of the country to an entity affiliated with the mineral producer in DRC at a price below market value). Practices of this nature are illegal in many countries, though the DRC has yet to legislate on the issue of transfer pricing.

Special Issues in the Mining Tax Regime

- *Retrocession of mining fiscal receipts.* The problems involved with tax payments and the recording thereof will become much more difficult as the Government implements the constitutionally mandated decentralization program. Under the terms of the Mining Code, 40 percent of collected mining royalties, as well as 10 percent of

[17] See Annex 3 for definition and details on the calculation of Effective Tax Rate.

surface rents, should be retroceded to the provinces (25 percent for the provincial administration and 15 percent for the area where mining activities are conducted). In addition to the retrocession of royalties provided for in the Mine Law, the Constitution stipulates that 40 percent of all tax revenues coming from national enterprises,[18] including mining-related tax revenues, be retroceded to provinces. However, the Constitution does not specify exactly how this is to occur, which criteria are to be used for the calculation, or the dispositions for accounting and monitoring of the revenues. Retrocession of revenues to the provinces poses the obvious problem of reinforcing capacity at the provincial and municipal levels to account for and use the funds appropriately. The absorptive capacity of the provinces to accommodate the large revenues flows could also be an issue. There are also issues of equitable distribution of revenues among the provinces. Other countries, such as Australia, have tested mechanisms that provide for the division of mining revenues among the states; these mechanisms combine statutory dispositions as well as annual consultations on a political level. Another problem which has occurred in some countries is the relative authority, jurisdiction, and mandate of the central versus provincial governments to levy and impose taxes. In DRC, certain provincial authorities have voiced a desire to levy additional taxes or charges on companies, in spite of the fact that the Mine Law is explicit in specifying all taxes to be applied to mining operations.

- *Fiscal harassment.* There is a danger, as the State seeks to enhance its legitimate revenues from the mining sector, that Government officials can be over zealous in their relationship with private companies. In many countries, the evidence would suggest that arbitrary and blatant abuse of authority by tax officials can be a significant hindrance to mining investment and, not incidentally, to the honest and accurate declaration of revenues and payment of taxes. It is alleged that in DRC, certain tax authorities have harassed companies with respect to the payment of additional taxes and/or very high penalties. In the majority of circumstances, these additional tax payments are negotiated downward and penalties reduced or eliminated altogether - to the satisfaction of the company and the tax inspector.

- *International reporting standards.* A number of initiatives are underway to develop international taxation reporting standards for the mining industry. As yet, however, there are no recognized international standards for calculating and reporting these taxes, except the general standards enunciated in the International Financial Reporting Standards, which are used in many (but not all) countries. Preparatory work[19] to develop a template for calculating and reporting tax payments of the extractive industries has been undertaken for the Extractive Industries Transparency Initiative, funded by a consortium of non-government organizations. Further research on this topic is taking place in the various countries which are implementing the EITI. Major international stock exchanges also have very specific rules and guidelines for the reporting of taxes and disclosure of how the taxes are calculated, though these guidelines do not necessarily address specifics at the country level. The International

[18] The phrase in the Constitution is *enterprise à caractère national*, which is meant to apply to large state-owned enterprises and other industrial enterprises, including joint venture and partnership arrangements with various mining companies.

[19] Global Witness, *Extracting Transparency,* 2005. Funding for the study provided by Global Witness, CARE, Save the Children UK, Open Society Institute, Transparency International, CAFOD, Publish What You Pay.

Monetary Fund has developed the Report on Observance of Standards and Codes (ROSC), which provides guidelines for tax reporting, including specific dispositions relative to the extractive industries.

Effective Administration of the Mining Sector

The administration of the Mine Law, regulations, and tax regime is completely dysfunctional.

Administration of Mine Law and Regulations

Exploration permits. The fundamental objective of the first-come, first-served philosophy of the Mine Law is to encourage private sector companies to invest and take the risk of exploration to find new mineral resources. This has proved to be very effective in other countries, *provided that* the Government is vigilant in ensuring that the ground is worked and not simply held for speculative purposes. Unfortunately, in DRC, many (but not all) of the exploration permits would appear to be held by local and foreign interests for speculation rather than serious exploration work.

The issuance of the permit is relatively straightforward, and the mine cadastre service created by the Mine Law – CAMI – has functioned reasonably effectively (though with some difficulties, as outlined in the next chapter) to issue permits and keep appropriate records. However, the monitoring and evaluation of work performed by permit holders is nonexistent. The Directorate of Mines, which is nominally responsible for inspections, does not have the personnel, equipment, or presence in the mining areas to conduct the inspections. As a result, the Government is largely ignorant of a company's compliance with its work program obligations, stipulated in the Mine Law as annual expenditures on exploration in an amount 10 times the annual surface rents. In addition, the exploration permits may change hands or be leased to other companies without the knowledge of the Government and in violation of the Mine Law. For instance, in Kasai Occidental and Katanga, it is alleged that holders of mineral rights lease their permit areas to other companies. The fees charged for these leases are many times the applicable rates in the Mine Law and are levied without the knowledge or permission of the Government. The Government is also deprived of revenues which could be generated by these transfer activities.

Exploitation permits. The Government's ability to monitor and evaluate the work conducted on these exploitation permits is seriously deficient. As with exploration permits, the Directorate of Mines lacks personnel, training, and logistical support to properly inspect the exploitation activities. The situation is particularly acute with respect to compliance with environmental, health, and safety standards. While the larger mining companies appear to follow reasonable (but far from complete or adequate) standards, the medium and small-sized companies comply with few standards at all. This is due, in part, to the fact that many of these companies are new to the mining industry and lack the experience with applicable standards. In other instances, the companies appear not to want to incur the additional costs required for compliance with the standards. Finally, and most importantly, the exploitation may not be of an industrial nature, by rather conducted by artisanal miners who then render the production to the exploitation permit holder. The number of miners and the anarchy prevailing in the mining sites greatly complicate the task of ensuring compliance with

appropriate health, safety, social, and environmental standards, even if the legal permit holder or the Government wishes to do so.

Processing permits. Mine wastes are considered by the Mine Law to be artificial mineral deposits, so their processing is subject to a special permit. Though the Mine Law does not provide for such permits for companies whose operations are not tied to a specific mineral asset, many furnaces and other processing companies, particularly in Katanga, have obtained exemptions from the Ministry of Mines or the provincial government that allow them to process the ores sold to them by artisanal or small-scale miners. Since these are industrial processing operations, not mineral exploitation or beneficiation operations, they should be subject to other legislation, such as the General Investment Code. In addition, most of the processing operations do not comply with requirements for environmental impact assessments or management plans. One processing plant in Katanga is allegedly emitting effluent into the aquifer that supplies the city of Lubumbashi with drinking water.

Another issue is the apparent number of exemptions granted to trading companies to export mineral commodities in a raw or unprocessed state. This is illegal under the Mine Law. In April 2007, the Governor of Katanga province closed the border to these exports, causing significant disruption in Lubumbashi and in Zambia, where the refining and processing facilities are located. The closure has been relaxed, but many companies are still in an irregular situation. The Government will need to review a number of the exemptions to ensure that companies are in compliance with their obligations under the Mine Law.

Possible Improvements to the Mine Law

While the Mine Law and regulations provide the basis for encouraging and sustaining development of DRC's mineral resources, some revisions could be considered. For example:

- The system of granting, through the provincial authorities, special "diggers" cards to artisanal miners is difficult to put into effective practice. As explained in the chapter on artisanal mining, few miners actually bother to obtain the card, partly because the US$25 annual fee is prohibitive, and partly because of the time and effort involved in acquiring a card from the authorities. Also, the occupancy right granted to the artisanal miner for the year the card is valid does not provide sufficient security of tenure to allow the miner to invest in rudimentary mechanized equipment and tools to improve productivity.
- Large surfaces areas titled to private companies for exploration or exploitation could be reduced (by 50% or more) when the permits are renewed or at specified times during the validity of the permit. The government could also require companies to begin serious work within six months. This would encourage companies to invest and work the ground instead of simply speculating in mineral rights. For exploration and exploitation permits, the government may withdraw the permit if the company does pay the required surface rents.
- Provisions regarding environmental protection and, specifically, the preparation of environmental impact statements and management plans, could be improved. Provisions in the Mine Law need to be clearer with respect to disclosure of the environmental impact statement (EIA) and the environmental management plan (EMP) to local communities. Provisions related to consultation mechanisms with local communities also need to be enhanced, with possibly the provision to enter into a "benefits investment" agreement with the local community.

- Disclosure mechanisms and procedures in the Mine Law could be improved, particularly the material terms, conditions, and obligations of the investor under the permit. The current international trend is to require greater disclosure of the terms and conditions pertaining to the issuance and maintenance of the mineral right. This is driven in part by requirements for listing companies on major international exchanges.

Administration of the Mining Tax Regime

There is a significant gap in the taxes that should be generated from the mining sector and the tax receipts received and officially reported by the central authorities.

Box 1. A Reality Check on the Numbers

It is impossible to make any definitive statement about the amount of taxes the mining sector generates – except that the Government does not collect and record enough of them. In past years, government agencies produced reasonably reliable and accurate statistics on taxes paid by the mining sector. This is no longer the case. The statistics available publicly and those made available to the International Monetary Fund and the World Bank are poorly organized, incomplete, and of dubious reliability. This is due in part to the confusion in mandates of the agencies responsible for taxation, as well as their lack of capacity and logistical support. Also, the nomenclature and classification system does not lend itself to identifying specific sector revenues or to matching payments of a specific tax with the entity that pays the tax. As a result, neither the Government nor its international partners know, with a reasonable degree of certainty, the production values and tax revenues generated by the mining sector, or the amounts effectively collected and recorded in the accounts of the Central Bank.

Several agencies are responsible for assessing and collecting some portion of the taxes generated by the mining sector.

- Central Bank (BCC) is the central repository of all payments to the treasury;
- *Office des Douanes et Accises* (OFIDA) collects customs taxes, duties, export taxes, and service fees on exports;
- *Direction Générale des Recettes Administratives, Domaines, et de Participations* (DGRAD) collects mining royalties, fees assessed by the Ministry of Mines for various licenses and authorizations, and the surface rents assessed by the Mining Cadastre Service (CAMI) for the issuance and renewal of mineral rights;
- *Direction Générale des Imports* (DGI) is responsible for assessment and administration of taxes on profits, dividends, value added, and other taxes.
- *Other government entities and agencies, include:*
    - Office Congolais de Controle(OCC), responsible for import and export goods quality control;
    - Private banks where taxes are paid before transfer to the Central Bank's treasury account;
    - Some mining administration services which may collect fees, such as the mining provincial administrations, the direction of environmental protection, SAESSCAM, the CTCPM, CEEC, and CAMI;

The Tax Gap

Table 6 summarizes the tax receipts recorded by the government for the years 2003 – 2006.

Table 6. Principal Mining Taxes Received by Category
US$ millions

Category	Assessment/Collection	2003	2004	2005	2006
Import/Export customs and taxes	OFIDA	11.4	10.2	11.6	NA
Surface rents, permit fees, royalties (US$86,000 in 2005)	Ministry of Mines/CAMI/DGRAD	3.8	2.8	3.6	11.7
Turnover, income, dividend, and other taxes on business receipts	DGI	1.2	2.6	11.4	NA
Total receipts		16.4	15.7	26.7	11.7

Sources: Government of Congo and International Monetary Fund.

There are large statistical anomalies which suggest a gap in the amount of taxes actually received and the amounts that should have been received. For instance, in terms of payments reported by DGRAD (essentially surface rents and mine royalties), the government should have collected US$47 million in 2006 – US$32 million in royalties[20] plus an additional US$15 million in surface rents. However, DGRAD reported the receipt of combined royalty and surface rent payments of only US$11.7 million in 2006 – a gap of US$35 million gap. As of 30 June 2007, DGRAD reports the collection of US$24 million, against a yearly target of US$175 million. It is also unclear whether the amounts reported as received by DGRAD have actually been effectively received in the accounts of the Central Bank. The threefold increase of royalties and surface rents reported by DGRAD, from US$3.6 million in 2005 to US$11.7 million in 2006, is also disturbing and cannot possibly be explained by growth of either production or prices in the sector, but rather by sloppy and inconsistent record keeping. The disparity is even more glaring in the case of royalties: DGRAD reports royalty payments in 2005 of US$86 thousand and US$2.4 million in 2006.

Other irregularities and deficiencies in tax assessment and collections are also apparent. The management systems in place in CAMI, DGRAD, and the BCC do not permit adequate tracking of the manner in which surface rents are paid and recorded. In 2007, DGRAD receipts account for only 27 percent of the total surface rents invoiced by CAMI to companies. It is noted that companies cannot renew or maintain their mineral rights until they pay these surface rents. At the time of that mineral rights are issued or renewed, companies must also pay site rehabilitation guarantees. These guarantees totaled an estimated US$60 million in 2006. However, the funds do not appear anywhere in the government's accounts, and it is reported that no government agency has any knowledge of them. Finally, there is considerable confusion about the statistics collected on the volume and value of diamond exports among the various reporting agencies.

In terms of overall taxation receipts (royalties, surface rents, taxes on profits and dividends, and other fiscal levies), as a general rule and over time, the experience in other mineral

[20] The 2 percent royalty on the non-ferrous metals exports from Katanga would total US$10 million on the basis of exports valued at US$500 million In diamonds, the royalty would total US$22.5 million, based on 3-4 percent royalty on diamond exports valued at around US$600 million, as reported in the Kimberley Process. It should be noted that if the royalty payments on non-ferrous metals are discounted to a net smelter return basis (a deduction of about 40 percent of the value to take account of smelting and refining charges – a common basis to assess the royalty, even though this is not explicitly stated in the Mining Law) – the royalties paid should would be on the order of US$6 million in 2006).

producing countries indicates that between 10 – 15 percent of the total export value of mineral products should flow to the government through taxes. Katanga is the most formalized part of DRC's mineral production chain. On the basis of an estimated US$500 million in exports going through more or less formal channels, one could assume that around US$50 million in tax revenues would be generated. However, for 2005 the government reported the collection of only US$26.7 million in all taxes from the entire mining sector. The scenarios of future mining development in laid out in previous chapters suggest that US$88 million should be contributed per year from all of the current mining operations in the country, though this is probably an underestimate.

If remedial actions are not undertaken, the tax gap will get worse as the sector grows. Table 7 shows estimations of production and taxes that were developed using the base case scenario for growth of the mining sector through 2012.

Table 7. Expected Mining Sector Fiscal Receipts
US$ Millions

Base Growth Scenario	Existing Data As Reported	Expected Taxes Annual Average 2008-2012	Expected Taxes Annual Average 2013-2017
Production Value	2,000	2,651	3,792
Taxes			
- Royalties	32	39	57
- Income Taxes	11.4	63	362
- Export Taxes		18	26
- Import duties	11.6	23	29
- Dividend taxes		12	75
- Dividends		0	27
Total fiscal receipts	**26.7**	**185**	**619**

Source: World Bank staff estimates.

The gap between taxes owed and taxes officially collected and reported is the result of several factors[21]:

- Alleged non-declaration of production volumes, and/or under-valuation of key mineral commodity exports by producers and traders;
- Smuggling and clandestine exports, particularly in the east of the country;
- Inaccurate and incomplete financial data concerning taxable income/events in declarations of companies and traders to government authorities;
- Lack of computerized reporting and recording systems between the central bank and the collecting agencies (DGRAD, OFIDA, DGI);
- Alleged fraudulent practices and falsification of documents within government services charged with assessment, collection, recording, and reporting of tax receipts;
- Lack of capacity within government to independently measure and verify tonnage and assay the quality of mineral exports;
- Non-existence of independent audits of mineral exports and taxes paid to and received by the government.

[21] The Governor of the Central Bank issued on June 14, 2007, a public announcement to the effect that a conspiracy had been unmasked whereby companies with the complicity of government would falsify documents to defraud the government of legitimate tax revenues. The Governor announced a series of audits for the years 2005 and 2006.

Possible Improvements to the Tax Regime

- *A sliding-scale royalty* could be introduced. This approach has been used in some countries to capture a greater share of taxes for the government in the event of significant increases in commodity prices. Generally accepted practice is a combination of fixed royalties based on a percentage of the sales price or net smelter return of the mineral commodity combined with taxes based on profits. A sliding scale royalty establishes a floor price for the mineral commodity and defines a royalty rate based on that price. As the price of the commodity rises or falls, the royalty rate is adjusted up or down. A criticism of royalty based taxes is that they do not take into account the costs of production or investment, and thus could penalize a producer in the early years of production. High royalties also tend to raise the cut-off grade of the ore body (the minimum grade of ore which can be mined profitably) with the result that some orebodies remain undeveloped. On the other hand, over the past two years there has been a significant increase in commodity prices with the result of new investment in mining in Africa and other countries. There is some disappointment in many countries that the taxes paid by the sector are not commensurate with either the increased prices or the levels of production. Recent studies of the mining sector in Zambia report that, in spite of significantly increased production over the past two years, the mining sector as a whole contributes only 0.7 percent of total government fiscal revenues[22]. There may be valid explanations for this: generally it takes five to seven years before income taxes are payable, depending on the amounts deducted from taxable income for the amortization of loan reimbursements. Nonetheless, there is growing international sentiment to rethink the standard model of fixed royalties in favor of more flexible mechanisms which are responsive to market prices.
- *A tax on the transfer of a mineral rights title* could be put into place. The transfer, leasing, and mortgaging of mineral titles are permitted under the Mine Law (Titles VI and VII). This in recognition of the fact that many smaller companies will take an exploration permit with the intention of finding a mineral deposit, and then sell the title to a larger company that can develop the mining site. To the extent that some financial consideration has been paid to the transferor by the transferee, a taxable event has occurred in the host country. The country would normally have the right to collect a tax on the value added or capital gains generated by the transaction.[23] However, these capital gains are rarely taxed. The companies often channel the transaction through other countries (frequently tax havens) where capital gains/value added are neither declared nor taxed. Also, the transaction may not be an exchange of cash, but rather of stock or some other consideration, which would be difficult to assess and evaluate. A possible solution would be to institute a mineral rights transfer tax based on a percentage (for instance, 10 percent) of the capital gains or value added of the transfer, the fair market value of which would be determined, at the expense of the company, by an independent specialized firm approved or licensed by the government.

Other Principles of Governance of the Mining Sector

[22] The non-government organization "Christian Aid" has conducted some research in Zambia on the mining taxation issues in that country.

[23] In countries with efficient tax collection systems, the "profit" or "capital gain" generated by the sale of mineral title would be taxed under the general income tax regulations of the country.

Governance of the mining sector in DRC needs significant improvement, particularly in the areas of government equity participation, disclosure, transparency of revenue streams, avoidance of conflicts of interest, and traceability of mineral commodities.

Government Equity Participation

A cardinal principal of good governance in the mining sector is the clear distinction between the government's role as regulator of the sector and as possible shareholder in joint ventures. As previously noted, the Mine Law requires that 5 percent of the capital stock, free of charge and non-dilutable, of a company acquiring an exploitation permit must be granted to the government at the time the permit is issued. This shareholding is in addition to whatever shares may be held by state-owned entities by virtue of a partnership agreement. It is not uncommon in many African countries to require a certain level of government ownership in mining enterprises. Companies are generally not opposed to government shareholding, provided that it is are not excessive, that the company retains management control, and that the dividends which may attach to the shares are paid only after the company has achieved payback. However, this practice has three main drawbacks.

First, the dividend streams with respect to the government's shareholdings may never materialize. The level of government participation is rarely enough to permit the government to have meaningful influence on corporate policies relative to declaration and payment of dividends.[24] Sometimes the company receives tax holidays or other incentives as compensation for the grant of free equity participation, which ultimately diminishes the tax returns to the government. In other instances, the company advances or loans the government the funds necessary to acquire the shares. This practice has been widely abused by some companies, which charge excessively high interest charges on such shareholder loans.

Second, and as important, there is an inherent conflict of interest with respect to the government's obligations as shareholder in a commercial venture and its duties to protect the rights and interests of all citizens. This is particularly the case if the government is called upon to adjudicate a conflict or problem involving the company, other companies, and/or the local community.

Finally, many governments have difficulty in managing the shareholdings. Most often, as part of their official duties, representatives of the Ministry of Mines are a member of the board of directors of the company. In other instances, especially where the government may have shareholding interests in multiple companies, a special unit within the Ministry of Finance is set up to manage portfolio investments. However, government rules are rarely sufficiently clear concerning the mandates, powers, and decisionmaking parameters which govern the participation of its representatives on a company's board.

Conflict of Interest

The Mine Law (Article 27) specifically declares ineligible to hold mineral rights all civil servants; members of the armed forces, police, and security services; judicial authorities; and

[24] In some instances the government shares are "golden." That is, for important decisions effecting company operations, unanimity may be required, thereby giving the government effective veto power over such decisions. However, the unanimity rule generally does not apply to the declaration and payment of dividends.

employees of parastatal companies involved in mining operations. This prohibition is standard in most modern mining legislation to avoid obvious conflicts of interest. However, the Mine Law specifically exempts government officials from restrictions on owning shares in mining companies. This loophole has led to persistent allegations that government officials, civil servants, and politicians at the central and provincial levels own shares in mining companies. It would be appropriate to require full disclosure by all government officials and politicians of material stock holdings in mining companies.

Additionally, the Mine Law does not specifically prohibit civil servants or other government officials from serving on boards of directors or as officers of mining companies. However, other legal or administrative documents, such as the corporate by-laws and/or labor agreements, may contain such prohibitions. Unless service on the board is part of the official duties of the government representative with respect to the 5 percent state ownership of shares, such service would be a clear conflict of interest. It is noted that the governor of the Central Bank and the Minister of Portfolio Investments[25] were elected to the board of directors of Katanga Mining in October 2006. Even if their membership on the board is in connection with the 5 percent government shareholdings in the company or the result of other contractual obligations, two government board members out of seven total board members would seem excessive.

Tender of Mineral Properties

The Mine Law of 2002 provides that the government can tender mineral properties that are not held under permit by another party and for which sufficient exploration data exists. The Ministry of Mines plans to publish a list of properties to be tendered on this basis. Tender of mineral properties can be an effective and transparent means to ensure that the state receives appropriate market value for its mineral resources. However, international experience has been mixed with respect to the tenders of hard-rock mineral properties. The essential prerequisite to a successful tender is proven mineral reserves, generally determined through extensive exploration and scientific investigation. There are few properties in DRC which would have this level of proven reserves that are not already under permit to state-owned enterprises and private companies. Further, if properties are available, the tender needs to be carefully organized and carried out. Generally, a phased approach is used to advertise the property, identify a long and short list of companies, allow the potential bidders to inspect the property and related data, establish precise criteria by which proposals will be evaluated, receive and evaluate proposals from companies, and negotiate a mineral development agreement. Governments generally receive an up-front payment in addition to the company's commitment, backed by a performance guarantee, to complete a due diligence examination of the property and, in the event it decides to proceed, an indication of the plans envisaged for the development of the resource. Internationally there have been some successful tenders which have resulted in the development of a mine, such as the Antamina project in Peru. However, there have been more cases where tender operations have failed, as happened in many countries former Soviet Union.

Extractive Industries Transparency Initiative (EITI)

[25] In a press release in July 2007, Katanga Mining stated that Ms. Mabunda Mudiayi, Minister of Portfolio, had resigned from its board of directors.

As noted above, DRC faces a serious challenge with respect to the payment of mining taxes and the recording of fiscal receipts. This situation is not unusual in countries with large revenues streams from the extractive industries. The Extractive Industries Transparency Initiative (EITI) was launched by the Government of the United Kingdom and is supported by the World Bank and numerous other donors[26]. EITI is a voluntary initiative which brings together government, private sector companies, and civil society representatives to devise mechanisms by which companies can fully disclose their tax payments and the government can fully disclose receipts from the mining sector. As of June 2007, about 28 countries are in various stages of implementing the EITI.

The Government of the DRC endorsed the principals of the EITI in March 2005, and a few months later issued a decree establishing an EITI implementation committee and designating the Ministry of Planning as the lead agency responsible for EITI. Good progress was made during the first semester of 2006, including the commissioning of studies of the copper/cobalt and diamond sectors. However, during the period of the elections through the installation of the new Government (June-December, 2006), progress in implementing the EITI slowed significantly. In February 2007, the new parliament adopted the Governance Contract, which specifically sets rapid implementation of the EITI as a priority. Key officials, including the Prime Minister, and the ministers of Mines and Planning, have reiterated the Government's commitment to EITI, and a new decree issued in August 2007 strengthened the Ministry of Planning's role in the implementation process. After some initial concerns that EITI rules about the effective engagement of civil society and private sector companies in implementing the program, the steering and consultative committees have begun deliberations with the participation of the various partners. A work program to implement the EITI over the next 12 months is now under preparation.

At the EITI meeting in Oslo in October 2007, the international board of directors "pre-validated" the compliance of various countries that have announced their adherence to the Initiative. In order to maintain its good standing within the EITI, the Government of DRC must submit evidence with respect to (i) an official announcement of adherence to the principles of EITI; (ii) effective engagement with civil society and the private sector; (iii) nomination of a senior government official responsible for the Initiative; and (iv) publication of a work program. At the time of the meeting, the DRC was deemed in compliance with three of the four criteria. As the work program has not yet been published the EITI Board agreed to establish a separate list of countries, such as DRC, which require additional time to comply with the criteria.

The World Bank and other donors are prepared to fund the implementation of EITI in DRC once it is determined by the EITI board that DRC is in compliance with the requirments. Budget estimates are being prepared for the work program and will be about US 1.5 million through end 2008. Funding of the implementation can be through EITI trust funds administered by the World Bank supplemented by other donor funding.

Because the EITI is a voluntary initiative, the free rider question often arises. Many countries are reluctant to disclose tax information on individual companies, and thus amalgamate the information on a sector basis. A company that does not voluntary submit data is thus getting

[26] A permanent secretariat of EITI has been established and is now based in Oslo, Norway. A Board of Directors, composed of representatives of implementing countries, private companies, and civil society is also established to provide supervision over the implementation of the process.

a free ride. For this reason, over time the objective in DRC (as in some other countries) is to pass legislation requiring that all companies disclose their tax payments. The EITI can be a useful precursor to the adoption of such legislation.

Disclosure

Disclosure is the keystone of effective governance in the mining sector. The trend internationally is towards publication of mining agreements and contracts, though this is far from a universally accepted practice. In the case of the DRC, given the controversies surrounding the contracts, some of the contracts have been published and are available on the Ministry of Finance webpage: http://www.minfinrdc.cd/contrats_partenariat.htm and http://www.minfinrdc.cd/contrats_partenariat2.htm. In future, the Government would need to adopt special regulations to require publication with protection of company proprietary information and to specifically waive any confidentiality agreements in the contracts. But publication of the contracts by itself is not sufficient to ensure proper disclosure. In addition to publication of the contracts, regulations could be adopted to require disclosure of shareholders, information on board members, internal decision making procedures, checks and balances in terms of corporate governance, inter-locking holdings, and other elements. These regulations should specify what is to be disclosed, the frequency and methods of disclosure, and principles of materiality and relevance, using as a model the disclosure rules of the Toronto or Australian stock exchanges.

There are other national and international initiatives which encourage disclosure. The OECD has developed guidelines for disclosure and corporate operations in fragile states. The Global Reporting Initiative has developed special reporting guidelines for mining and extractive industries. The International Council for Metals and Mining has also issued guidelines on community relations and outreach for mining companies. Finally, various codes of conduct for companies exist under the auspices of the United Nations, industry groups, and national governments.

Traceability, Certification, and Fair Trade

There are a number of initiatives presently underway in DRC relating to traceability, certification, and free trade. These initiatives are premised on the idea that if the unique mineralogical characteristics of the mineral ores or stones can be used to identify the producing site, then the site could be certified as conflict free and/or in compliance with applicable environmental, safety, and social standards. Such certification would add value in the terminal market, where the final consumer would pay a higher price for the commodity.

Fair and green trade initiatives in coffee, timber, and other agricultural products have been increasing successful over the past few years. The most successful certification program for minerals has been the Kimberley Process, which was established in 2003 following a conference of major diamond producing states. At the time, considerable international attention was focused on revenues from artisanal diamond production being used to support the civil wars in Sierra Leone, Angola, and other African countries. Member states of the Kimberley Process use national institutions and inspection services to ensure that diamonds have not been produced in conflict zones, following the guidelines, standards and procedures set up by the KP steering committee. In DRC, the Diamond and Precious Metals Evaluation Center (CEEC) is the government institution which, in addition to valuation of the diamonds, certifies that they are not produced in conflict free zones. Recent reviews of the worldwide performance of KP have noted that it has been reasonably successful in stemming the trade in

blood diamonds, though this may also be due to a cessation of hostilities in many of the producing countries. In DRC, government sources believe that the Process captures 70 percent of the diamonds produced in the country, though other observers suggest it may be more on the order of 50 percent.

In addition to the Kimberley Process, there are initiatives to certify the origins of cobalt, copper, tin, tungsten, and coltan. The Belgian Government is supporting scientific investigations by the Royal Museum of Tervuren and other academic institutions to identify unique mineralogical characteristics of heterogenite (copper-cobalt) ores from artisanal mines in Katanga. The German Government, through the German Federal Institute for Geosciences and Natural Resources (BGR), uses a similar approach with respect to tantalite, cassiterite, and tungsten ores produced by artisanal miners in the eastern provinces of the country. BGR envisages a pilot project of a certified trade chain (CTC) in Central Africa, focusing on artisanal mining and working in close partnership with consuming industries on the basis of voluntary commitments. This pilot effort is principally concerned with developing the template for a scheme that might be utilized after review by a range of stakeholders. The certification scheme is sensitive to the environmental and social conditions of production and trade, and generally attempts to incorporate the core concerns of the OECD Integrity Instruments, the Voluntary Principles on Security and Human rights, the IFC Performance Standards, and the Extractive Industry Transparency Initiative. There is also the Durban Process[27], which is discussing with the UK Government certification of a model mine as well as other approaches in coltan producing areas. Other technologies are under development to "fingerprint" the origins of certain mineral commodities, such as the platinum group metals under the leadership of Norilsk Nickel Mining and Metallurgical Company (Russia) and South African national police research teams in the case of illegal gold and platinum consignments.

These initiatives are still in the nascent stage and a number of questions remain to be answered.

- First, is it possible to identify mineralogical characteristics with sufficient precision to distinguish ores by producing site? In order to certify the mineral, the tracing system must identify the ores at the production site. Once they have been transported, stockpiled, or smelted they will have been mixed or blended, rendering specific site identification impossible. Scientific work to identify the characteristics of ores from different sites is underway, but so far it is still not easy to identify ores with precision. Characteristics of cassiterite ores, for instance, may be the same for the whole of Kivu province or Rwanda, and not traceable to a single exploitation site. So far, the German working group BGR has identified specific signatures for coltan ore provinces throughout Africa by matching isotopic age and trace elements with mineralogical features. Thus the positive definition of a single producing locality may be possible for coltan ores. In Katanga, a Belgian study team suggests that varying levels of background radioactivity, in combination with the relative proportions of cobalt and copper in the ore, may make it possible to distinguish various sites. But the scientific research work in both the east of the country and in Katanga is incomplete.
- Second, what will the traceability and certification mechanisms cost? A number of factors need to be considered. Laboratory analysis and assays would need to be carried out at all

[27] The Durban Process is less formalized than the Kimberley Process and aims to introduce a measure of traceability and tracking in the mining of coltan and other ores principally in the east of the Congo.

production sites, or at least at a representative sample of sites. Rough estimates of the costs involved from a commercial laboratory in Lubumbashi suggest US$400 per sample of 45 tonnes of ore. In addition to direct laboratory costs, personnel costs would likely be substantial. In order to provide for effective coverage of the many artisanal mining sites in the country, a cadre of inspectors would have to be mobilized, trained, supported logistically, assigned to the sites, and paid sufficiently and regularly. The costs of the personnel support required to cover the thousands of sites in DRC (or even in a single province or for a single commodity) are likely to be substantial.

- Third, what are the benefits of the traceability system? An economic valuation using appropriate measurements needs to be carried out. For instance, what is the premium that the terminal market consumer is willing to pay for certified mineral? Certified diamonds and gold jewelry sold in retail markets can command such a premium, but it is less clear that industrial consumers of copper or cobalt would be willing to pay it.
- Fourth, what is being certified? The Kimberley Process certifies non-conflict diamonds, a relatively easy and straightforward determination. But how should compliance with labor, environmental, health, safety, and social standards be certified, especially in artisanal mines? What objective standards should be used? Many of the current standards in DRC are outdated, and others do not exist. In theory, passing on the premium to the artisanal miners would provide an incentive to improve compliance.
- Finally, have the unintended consequences of traceability and certification been identified and assessed? However well intentioned, a traceability system could have the effect of harming the intended artisanal beneficiaries if their products were in some manner prejudiced in the market. The non-certified mineral products would presumably be sold at a discount relative to certified products, meaning that the artisanal miner would be penalized. These types of concerns were raised in a UN study on the proposals to apply sanctions to "illegal" mineral producers in DRC. Hence, before beginning a regional certification initiative in artisanal mining, the Government should carry out a pilot project that tests the conditions on the ground and identifies possible negative consequences to artisanal miners.

Sanctions

Various UN Security Council resolutions since 2003 have addressed the issue of links between illegal exploitation of Congo minerals and the financing of armed groups and militias. Pursuant to these resolutions, a Group of Experts established to study these issues has prepared several highly informative reports.[28] The work of the Group of Experts[29] has been based on the concerns of the Security Council of the United Nations for the peace and security of the country. The mandate of the Group of Experts was to investigate the financing of illegal armed activities, and to propose ways to stop the financing of such activities. The reports have documented how armed groups such as the FDLR-FOCA, RUD-Urunana, many Mai-Mai groups and others continue to extort their share from the artisanal production, trading and transportation streams, particularly in the Kivus. In its report of January 2007, the Group of Experts recommended "…urgent intervention against all forms of illegal natural resource exploitation is required…" and that "…the existing laws of the DRC, particularly the

[28] The work of the Group of Experts has been invaluable in documenting abuses in the mining sector, especially in the east of the country.

[29] The Group of Experts refers to two separate groups established by the Security Council: the *Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth in DR Congo* and the *Group of Experts on the DRC (GOE)*.

regulations governing natural resources and their orderly exploitation, be used as a baseline for a new sanctions regime." Previous recommendations of the Group of Experts were with respect to sanctions on individuals or companies engaged in trade in minerals for arms. The recommendations in the January report go substantially further by proposing sanctions on companies and/or individuals engaged in illegal exploitation according to Congolese law.

The Security Council commissioned another independent report to assess the potential economic, humanitarian and social impact on the population of the DRC of possible sanctions. This report,[30] also published in 2007, raises a number of concerns with respect to the expansion of the proposed sanctions regime in DRC. The principal concern is the difficulty of determining what is and what is not illegal exploitation. Many artisans and middlemen engaged in the sector do so without proper authorization under the law. If the legal standard is applied without some modification, it would increase the number of sanctionable targets to an unmanageable level. It would also jeopardize the ability of the estimated 750,000 to 2,000,000 artisanal miners from earning a living and supporting their dependents. There are additional difficulties associated with the sanctions proposed in the Group of Experts report. In the absence of an effective government presence or trained Ministry of Mines personnel in the mining areas, the sanctions could not be enforced. There are concerns as well about access to due process, rights of appeal, and jurisdiction of competent judicial authorities. Further, given the boom-time atmosphere in DRC's mining sector, it is likely that an operator removed by sanctions would simply be replaced by another operator. Finally, the process of implementing the sanctions regime could become highly politicized and carry significant reputation risks for the United Nations and the international community.

Uranium

The Mine Law provides for a special regulation to be developed for strategic substances such as uranium, thorium, and other radioactive materials. The President of the Republic is accorded the power and responsibility to apply this regulation. However, such a law has yet to be developed and adopted. The matter of regulating radioactive substances is a pressing reality. The Shinkolobwe mine, which supplied the radioactive materials to produce the atomic bombs during World War II, partially flooded in 1956 and no official production has been recorded from the mine. However, artisanal miners still clandestinely exploit the mine and the vicinity for radioactive materials, putting themselves in considerable danger of being poisoned by radon gas. Also, varying degrees of radioactivity are found in most of the mineral deposits in Katanga. To the extent that background radiation levels of copper ores, for example, differed by exploitation site it could facilitate in tracing the mineral commodities.

With the present boom in uranium prices, it is understandable that the Government has received solicitations of interest from numerous companies to develop the uranium deposits. There is no reason *a priori* to not develop these resources. However, the Government should carry through with the creation of special legislation to regulate strategic substances and set appropriate occupational health and safety guidelines. Further, given the political sensitivities attached to the production of radioactive substances, the Government should require guarantees from the company, as well as full disclosure of experience in the industry and

[30] United Nations, Security Council, S/2007/68, "Report of the Secretary-General pursuant to paragraph 8 of resolution 1698 (2006) concerning the Democratic Republic of the Congo."

other commercial information. The Government will also need to exercise appropriate controls and adhere to all applicable international regulations. For this purpose, the Government may wish to call upon the specialized services and technical assistance of the International Atomic Energy Agency.

Government Supervisory Institutions and Capacity Issues

Government institutions responsible for regulating and supervising the mining sector are ineffectual. They require considerable restructuring and strengthening, and a greater measure of accountability.

In spite of DRC's relatively long history as a minerals producer, government institutions responsible for supervision of the mining sector are weak and ineffective. Historically, the *Générale de Carrières et des Mines* (GÉCAMINES), the Office of Mines of Kilomoto (OKIMO), the *Compagnie Miniere de Bakwanga* (MIBA), and other parastatals in key mining areas functioned as states within a state. Because these enterprises were the only holders of mineral rights, they effectively exercised authority over the sector, even though there was a formal government supervisory structure in the province. The new Mine Law specifies the government institutions which are responsible for administration of the Law and overall supervision of the sector. The organizational structure is consistent, on paper, with international practice. However, the Government faces a significant challenge to strengthen the institutions at the central and provincial levels so they can effectively exercise their constitutionally mandated responsibilities.

Some key institutions include:

- CAMI, the mining cadastre service;
- SAESSCAM (small-scale and artisanal mining extension service);
- CEEC (diamond expertise and evaluation office);
- Mining administration (directorates of mines, geology, investigations, and environment) at the central and provincial levels;
- CTCPM (technical planning and coordination unit);
- Independent commissions under control of the Minister (such as the Kimberley Process Commission);
- Services concerned with collection of mining taxes (OFIDA, DGRAD, DGI, OCC);
- Ministry of Scientific Research, responsible for geological mapping, geophysics, and earth sciences.

CAMI was established by the Mine Law as a semi-autonomous agency within the Ministry of Mines to issue and maintain a registry of mineral rights. In DRC, as in other countries, the mine title registry service is the key agency for implementing the licensing system provided for in the Mine Law. It needs to function smoothly, transparently, and impartially in order to provide security of tenure for holders of mineral rights. CAMI has been in operation since 2004, but has encountered some difficulties, including three changes of senior management, problems with software, and a high volume of requests for mineral rights. CAMI has processed more than 9.220 applications and has delivered more than 5,359 exploration, exploitation and other permits. A central issue will be the extension of CAMI's activities to certain key mineral producing provinces. At present, CAMI only has offices in Kinshasa and Lubumbashi (not yet fully operational). CAMI's absence from other key mineral areas

significantly impedes effective state control of mining operations. There is also a problem in tracking whether payments of surface rents (as noted above), as invoiced by CAMI, are effectively received by the Ministry of Finance/DGRAD and the central bank. There are also disturbing allegations of pressures on CAMI to deviate from established guidelines and criteria in the issuance of permits.

SAESSCAM was created in 2003 to serve as an extension service for small-scale and artisanal miners. At present, SAESSCAM has a staff of 120 and is operative in almost all of the provinces, but mostly in the capital cities and not necessarily in the artisanal mining sites. Reviews of its performance are inconclusive. On the one hand, the organization has been given relatively high marks for helping to organize artisans in some diamond producing areas and providing them with technical advice. On the other hand, many of its personnel lack the specific technical training and skills needed to advise the artisans. Also, there have been some allegations of SAESSCAM personnel demanding extra-legal payments from the artisans. It is clear the SAESSCAM could play a key role in helping to organize the artisans into effective cooperatives and also to serve as a means to properly record production in this sector. Yet, funding constraints and, more importantly, human capacity constraints have prevented it from being completely effective.

CEEC is the official state agency responsible for evaluation and certification of diamonds. As such, it is a key element in the effective implementation of the Kimberley Process, and in ensuring that the government receives fair market value for its diamond and gold exports. However, CEEC has not been as effective as it could be in terms of valuing these exports. There is considerable fraud and clandestine exports of stones, particular those of gem quality. Also, many of the valuators in the CEEC were initially recruited from private diamond trading *comptoirs*, which raises the possibility of conflicts of interest. It has also been alleged that CEEC's own valuations are below market value, and that key staff are themselves engaged in illicit activities. A key recommendation would be for an audit to be conducted of the CEEC. Also, the Government should consider engaging an international firm to provide counter-expertise on DRC diamond exports.

Mine inspection services (through the Directorate of Mines) in the provinces are wholly inadequate to perform their mandated function of monitoring production, health, safety, and environmental protection issues at industrial and artisanal mining sites. In Katanga, the Directorate of Mines has only 30 staff to cover a vast province with many operations. Moreover, the Directorate does not have adequate logistical support, laboratories, or vehicles necessary for it to function effectively. Training is also required of staff in technical specialties. Another example of the weakness of the mines administration to effectively monitor progress in the sector is its inability to assess and evaluate the work performed on the 471 exploitation permits in the country. These permit holders are, in theory, required to submit periodic reports to the Ministry and open their operations for inspection. However, the administrative services of the Ministry are as yet incapable of performing this function.

The *Ministry of Scientific Research* is responsible, among other duties, for geological mapping, geophysics, and earth science research. Updating and completing the geological database of the country, and of locating new mineral deposits, is crucial for sustainable growth in the sector. The geological research function is a joint public and private sector undertaking. Private companies generally focus on detailed exploration, such as drilling and ground truth geophysics, in precise locations with identified minerals. To identify these exploration targets, the companies rely on regional geological maps produced by the state

agency responsible for geological research. In DRC, little serious exploration on a regional scale has been done since independence. The result is that 90 percent of the country remains unexplored and the remaining 10 percent has been explored using techniques and scientific methods that are 50 years out of date. Moreover, most of the maps and data which do exist are not available in DRC, since the facilities and services in charge of archiving this information are defunct. Fortunately, the Royal Museum of Tervuren in Belgium, and other geological survey institutions in Europe and North America, have originals and copies of most of the geological information collected over the years in DRC. A program needs to be developed to transfer this data, in digital format, to DRC, so it can begin to reconstitute the national database of geological information. Another important aspect to improve scientific knowledge of the DRC resource base is the rehabilitation of certain university and research institute programs, some of which are under the Ministry of Scientific Research. Not only do the universities and research institutes produce valuable studies but they also, importantly, train future generations of Congolese earth science professionals.

Manpower Development

A significant issue for the development of the mining sector in DRC is the rapidly dwindling number of qualified mining sector specialists. In part, this is a worldwide phenomenon: the downturn of the industry during the late 1900s and early 2000s did not encourage new entrants into the sector manpower pool. In DRC, this situation is greatly aggravated by the lack of new investment during the period of civil turbulence. As a result, the training centers and workshops of GÉCAMINES, which had been among the best technical training centers for the industry in the world, are now closed. It is encouraging to note that the private sector mining companies in Katanga are discussing a joint program (with assistance from some donors) to rehabilitate and reopen these training facilities. However, local universities that would normally train higher-level manpower to adequately supervise, monitor, and evaluate developments in the sector are underfunded and themselves understaffed; and there is no local institution to teach the economic and financial skills required to assess companies' financial statements and feasibility studies.

3. Large-Scale Mining
The Role of the Parastatals, Private Companies, and Infrastructure

The Role of Parastatals

The state-owned mining companies which had previously dominated DRC's mineral production are moribund and bankrupt. The Government will face significant challenges in restructuring these enterprises with a view to ensuring the maximum contribution of their productive assets to the State, and the continuance of essential infrastructure and services in the communities where they operate.

DRC's mining sector has been dominated for years by several large enterprises owned by the government. The enterprises operated not as commercial enterprises but virtually as governments within a government – running schools, farms to produce food for employees, hospitals, social centers, transport, energy, and water infrastructure for the province. This system functioned well enough during the colonial period, but began a long descent in the mid 1970s. The Mobutu Government deprived them of cash surpluses which should have been used for re-investment, and this practice continued under the Government of Laurent Kabila. During the late 1960s, when copper prices were high, GÉCAMINES was unable to use the surpluses to renovate existing facilities or to invest in new technologies, as its competitors were doing. Directors and senior managers of the companies were named by the Kinshasa Government on the basis of politics rather than their commercial and technical abilities. There have been credible allegations (Lutundula Commission and others) of embezzlement, insider dealings, and other illegal activities by the former directors of some of the companies. The companies' workforces were out of proportion to production levels, resulting in low productivity. For instance, by 2002, GÉCAMINES' 45,000 employees produced 0.83 metric tonnes of copper per employee, compared to 96.42 metric tonnes per employee[31] of Codelco Chile (also state owned). The disruptions to security and supply chain management caused by the civil war made it difficult to access supplies or markets, forcing cutbacks in production. The result of these factors was that state-owned mining enterprises in DRC have slowly descended into insolvency, with severe repercussions for employees and the communities which depend on the enterprises for infrastructure services. Today, a major challenge for the Government is to determine what should be done with the enterprises, taking into account the special circumstances of existing workforce and social commitments, as well as the generic difficulties attendant to radical restructuring of dominant state enterprises in post-conflict states.

Partnerships

In the areas where they operate, the state enterprises still retain control over large mineral reserves, productive plant and equipment, and prospective exploration ground.[32] Beginning in the mid-1990s, the Government authorized many of the state-owned companies to enter into partnership agreements with private sector companies for the development of mineral resources. Some of these partnership agreements provide for the mineral rights held by the

[31] In 2002, Codelco Chile produced 1,630,000 metric tonnes of copper with 16,906 direct employees and 14,140 contractors. compared to 37,000 metric tonnes total production for GECAMINES.

[32] For instance, GECAMINES controls some 39,000 km^2 of exploration ground in Katanga; MIBA 78,000 km^2 of exploration ground in Kasai; other companies such as Kilomoto Gold control similarly large prospective areas.

Table 8. DRC Principal State-owned Enterprises (2006)

Enterprise	Location	Commodities	Concession Surface Area	Mineral Rights	Employees
GÉCAMINES (Générale des Carrières et des Mines)	Katanga (Kolwezi, Likasi, Kambove, Kipushi, Lubumbashi)	Copper, cobalt, coal, limestone, zinc, germanium	21,500 km²	42 PER 59 PE	13.359
OKIMO (Office des Mines d'Or de Kilomoto	Ituri Mongwalu and Watsa	Gold	83,000 km^2	49 PE	2.664, of which 1,317 are awaiting final indemnity payments
MIBA (Minière de Bakwanga) 80% government 20% Mwana Africa	2 Kasaï	Diamonds	62,000 km²	65 PER 151 PE	5,802
SOMINKI (Société Minière et Industrielle du Kivu)	Kivu, Kalima, Kamituga Punia	Cassitérite, Wolframite, Coltan,Gold, Monazite	90.08 Km^2	40 PE	4,209
EMK-Mn (Entreprise Minière de Kisenge - Manganèse)	Kisenge	Manganese	1940 Ha	1 PE	444
SODIMICO (Société de Développement Industriel et Minier du Congo)	Katanga (Musoshi, Kinsenda and Kimpe)	Copper, copper alloys, cobalt	827.23 km^2	5 PE	2,811

Source: CAMI; PE = Exploitation Permit / PER = Exploration Permit

state-owned enterprise to be transferred to a new entity established under the terms of the agreement. In other instances, the mineral rights are leased to the private sector partner under the terms of the agreement. There are, at present, up to 416 mineral rights issued to state-owned enterprises (107 exploration permits, 308 exploitation permits, and one research authorization for building materials). Of the total mineral rights issued to SOEs, 33 are subject to partnership agreements.[33] A significant legal issue is to determine the extent to which the mineral rights held by the state enterprises have been duly validated under the terms of the new Mine Law, and whether the surface rents have been paid in accordance with the legislation. In the case of MIBA and GÉCAMINES, there may be some question as to the validity of the mineral rights, including those subject to partnership agreements, because surface rents have not been paid or were not paid at the time due.[34] Also, in the case of some state-owned enterprises, the total surface area held under exploration permit may exceed the maximum of 20,000 Km^2 allowed by the Mine Law. Another issue is that state-owned companies are often remiss in monitoring the contracting company's compliance with its

[33] Annex 5 contains details on mineral rights held by SOEs.

[34] CAMI continues to grant a waiver to MIBA for the payment of surface rents given the financial state of the enterprise. However, the legal basis for doing so maybe questioned.

contractual obligations. To remedy this deficiency, GÉCAMINES has recently recruited a law firm from Belgium to assist in monitoring and evaluating the compliance of private companies with their partnership agreements.

Options for the Future

Levels of production in state-owned mining enterprises are insufficient to generate the revenues required to meet their obligations with respect to workers, suppliers/vendors, and community infrastructure. In addition, the enterprises are technically insolvent, burdened by high levels of short, medium and long-term debt. In devising its long-term strategy for the enterprises and restructuring them, the Government will need to consider how to (a) maximize the value to the State of the mineral assets, plant, and equipment that these enterprises control; (b) minimize distress to employees, vendors, and suppliers; (c) restructure the debt burden; (d) maintain some level of continuity with regard to the community and social services that the companies support; and (e) minimize new injections of public funds into the enterprises.

Options for achieving these objectives include:

- Continuing with the present state ownership and management structure, and search for external financing to reestablish production levels and ensure continuity in delivery of essential social services. This would require attracting support from international organizations such as the World Bank. However, most international development institutions refrain from direct investments in state-owned enterprises, preferring instead to emphasize private sector development. It is, therefore, unlikely that funding would be forthcoming from these sources. Moreover, the history of management of state-owned enterprises in DRC, as in many other countries, would indicate that this is not the best option in terms of managing the enterprises or relieving the burden on the public treasury of ever-increasing financial interventions.
- Granting operational and management control to an outside firm, similar to the arrangement that the French consultant, Sofreco, has with GÉCAMINES. A review of GÉCAMINES by International Mining Consultants Ltd. in 2002 – 2003 recommended that the enterprise be restructured into two units: GÉCAMINES "A" to hold productive assets, and GÉCAMINES "B" to hold financial and social liabilities. The study also recommended that the management structure be changed, with new directors and an outside company brought in with full authority to manage the enterprise with a view to re-establishing some production levels, though not those of previous years. In 2006, the Government appointed an outside firm (Sofreco) to manage GÉCAMINES and provide a business plan for further development of the enterprise. This approach has produced some initially promising results, though they were achieved with some difficulty and are far from complete. The outside management firm has been successful in stemming the financial losses at GÉCAMINES and stabilizing the finances of the enterprise. Importantly, arrearages in payments of salaries and for vendor/supplier services have been cleared up. However, the business plan for longer-term sustainability is behind schedule. This plan will detail how GÉCAMINES intends to continue and/or expand its own production from facilities still under its control, while at the same time managing the revenues it receives from its partnership agreements.
- Arranging to list the state-owned enterprise on an international exchange, such as London AIM market or another non-traditional market. This approach has been tried with some success by state-owned enterprises in other countries, such as

Kazakhstan's listing of Kazakmys, the copper producer. However, in most cases the management of the newly listed company is under private control, with the Government having only a passive interest. Also, to meet the requirements of the listing exchange, full technical, financial, and legal due diligence and audits would be required. As current DRC state enterprises are operating at a loss, the public offering would have to be carefully structured to emphasize future prospects in terms of developing new ore reserves, most probably in association with private companies. Successfully taking a state-owned mining company to the public markets will also depend on the robustness of the commodity prices and availability of risk capital in the equities markets.

- Acquiring a strategic private sector partner to own the majority of shares and to exercise full management control of the enterprise. In her statement to the press in June 2007, the Minister of Portefeuille declared that the Government would open the state-owned enterprises to private shareholder participation. The Government should ensure that the shares are properly valued, and should take into account the discounted value of future dividend streams from operations which may be developed by joint venture partners.[35] Additionally, a competitive bidding process could be used to select the most appropriate partner under favorable terms. The selection process should also consider how the new majority shareholders plan to operate the enterprise and develop its assets over the long term. In other countries, there have been unfortunate incidents of the new owners simply stripping assets from the company, without regard to long-term consequences to the State or the local community. The responsibility for environmental and social liabilities must be clearly discussed and understood by both the Government and the private sector stockholders.

The Role of Private Sector Mining Companies

The Mine Law of 2002 has made it possible for private sector companies to hold mineral rights for exploration and exploitation without a partnership with a state-owned enterprise. This approach holds much promise, provided that the Government is vigilant in enforcing compliance with applicable regulations and contractual obligations.

The mining industry is one of the most complex and competitive industrial sectors in the world.[36] Depending on the commodity, the production chain usually consists of extraction of the raw mineral, beneficiation and concentration of ores, smelting and refining of product, marketing and brokerage of commodities, and fabrication into end-use products. At all stages of the production chain, but especially at the exploration, extraction, and processing stage, the industry is highly competitive and growing more so every year. Of particular interest is the division of labor between the large "major" mining companies and the smaller, so-called "junior" mining companies. Each has an essential and distinct role to play in finding and developing mineral resources. Small companies – the juniors – explore, larger companies develop and operate mines. In the event of a discovery, the junior transfers the mining title to a large mining company, which will invest in developing a mining operation.

[35] For instance, MIBA, has had discussions with a private company, Mwana Africa, to increase Mwana Africa's current 20 percent ownership of MIBA to a majority shareholding. It should be determined whether the US$25 million offered to the Government by Mwana Africa for shares is a fair price, taking into consideration the possible future cash flows.

[36] An excellent overview of the international mining industry is provided in the report, *Breaking New Ground: Mining and Metals and Sustainable Development Project*, International Institute for Environment and Development, 2002.

Private mining companies operate in the international marketplace, where many commercial, financial, and political factors influence their decisions about investments in developing countries. For example:

- There is keen competition among companies to raise equity and risk finance on the international markets. While over the past three years there has been a significant increase in the amount of risk finance available to mining companies in DRC, this boom will not last indefinitely.
- Risk taking and deal making are necessary for sector growth. Entrepreneurship and the dream of striking it rich are part of mining culture. Under adequate supervision by the Government and international equities and commodities exchanges, there is nothing wrong with the deal making culture. However, fraudulent practices can easily develop, so vigilance and oversight are required.
- There is growing competition among all companies to acquire mineral rights in DRC. This has led to considerable speculation and the sale of permits without the authorization or even knowledge of the Government. Of importance, as well, is the entry into DRC of non-traditional mining companies such as Chinese, Indian, or other national players.

The role of non-traditional private companies. Over the past three years, a number of Chinese, Indian, and other non-traditional private mining companies have either obtained mineral rights or are working under partnership agreements with state-owned enterprises (primarily in Katanga). Legitimate investment from private companies of whatever nationality is to be welcomed, provided that the companies honor their legal and contractual obligations. The evidence to date is inconclusive in this respect. First, non-traditional companies generally do not have stringent requirements for public disclosure in their home countries, which makes information on their operations in DRC is difficult to obtain. This opacity applies to the investment, production, revenues, shareholders, directors, and other critical aspects of the operation. As noted in other sections of this report, lack of adequate disclosure is a problem with many companies in DRC, not just the non-traditional players. Second, some mining companies, including non-traditional ones, operating in DRC are not entirely compliant with international and/or local regulations relative to health, safety, and environmental protection. Finally, it would appear that Chinese investments, in particular, are part of an overall political policy and strategy which the Government of China is pursuing in DRC and other African countries in order to secure access to minerals.[37] China's infrastructure investments in DRC are conditioned on access to mineral resources for Chinese companies as is evidenced by the preliminary agreement between the government of DRC and a group of Chinese companies for infrastructure financing in return for access to develop mineral deposits. Negotiations on this deal appear to have been conducted at a political rather than technical level, and the details of the preliminary agreement have not been disclosed.

[37] See Jonathan Holstag, Gustaaf Geeraertsk, Jan Gorus, and Stefaan Smis, *Chinese Resources and Energy Policy in Sub-Saharan Africa*, Free University of Brussels, March 2007.

Box 2. Infrastructure for Minerals: the Chinese Connection

In September 2007, the Minister of State for Infrastructure, acting on behalf of the government of DRC, announced a series of preliminary agreements and understandings with a group of Chinese companies including the Exim Bank of China. The agreements call for the Chinese to provide financing in the amount of US$3 billion for general infrastructure development and US$ 2 billion for mining related infrastructure in return for access to as yet unidentified *in situ* mineral resources. As at this writing, little additional information is available about the terms and conditions of this financing. While investment of this magnitude in infrastructure is to be welcomed and, if carried out, will greatly facilitate the exploitation and export of minerals, it is not without some concerns. First, if the financing is on non-concessional terms and carries the obligation of a government guarantee it could be in violation of existing agreements with the IMF and World Bank. Second, the information publicly available does not specify the mineral deposits to be granted to Chinese companies, though there is some speculation that these are undeveloped properties in the portfolios of Gecamines and MIBA. If, however, the properties are already subject to partnership contracts then appropriate procedures would have to be followed to obtain the consent of the legal mineral rights holder for any transfer to the Chinese companies. Third, it is unclear whether future production and revenues from minerals have been mortgaged or used as collateral for the financing. Fourth, the preliminary agreement mentions certain tax exemptions and waivers which would be a violation of the Mine Law of 2002 and international best practice. Fifth, if deposits are freed up by virtue of modifications to the existing contracts, under the Mine Law the Government would have the possibility, if not the obligation, to tender the deposits. Finally, there are concerns, as evidenced in other countries, about the adherence to international norms for environmental, labor, health and safety conditions in mines operated by Chinese companies.

The Mining Contracts

Certain partnership contracts should be adjusted according to established and published objectives and criteria, with due respect for the rights and obligations of the parties, and in full cognizance of need to retain credibility in order to attract investment capital on the international markets.

A great deal of local and international controversy attends the contracts with private mining companies. In 1994 and 1995, in face of the inability of the state companies to maintain production, the Government began to allow them to enter into partnerships with private companies. The partnership agreements, known as conventions, put the mineral right at the disposal of the partnership; they also specified the investments and internal management of the partnership, and the modalities of exploration, development, mining, and commercialization.[38] This was a period of civil war, and it is alleged that some of these and

[38] During this period, negotiations were undertaken and, in some cases, conventions signed with the following private foreign companies: Swipco (Swiss), Lundin Group (Canada), Forrest-Outokumpo (Congo-Finland), Cluff Mining (UK), Banro (Canada), Mindev (Belgium-Canada), Barrick Gold (Canada), South Atlantic Resources (SAR, Canada), Union Miniere (Belgium), Anvil Mining (Australia), Gencor-Iscor-Broken Hill (South Africa). Source: Lutundula Commission Report, p. 6.

other contracts were awarded under opaque and suspicious circumstances[39] Many of the state-owned enterprises entered into these contracts at a time of distress or without proper evaluation of the assets under the partnership agreement. It should also be recognized that many of the private companies undertook significant risks during the civil war to enter into these partnership agreements and to pay the sometimes considerable up-front payments required. Also, given the high political risks at the time, some of the partnership contracts contain tax exemptions and allowances in favor the private partner.

An important step to improve governance and to avoid future controversies is the Governance Contract, adopted by the Government in February, 2007. The Contract recognizes rule of law as the central pillar of good governance, of which vital elements include respect for property rights and the sanctity of contracts. For this reason, decisions to annul, renegotiate, amend, or adjust mining contracts authorized by the Government should not be taken lightly. International law and practice (as well as the contracts themselves) do recognize the right of contracting parties to modify the agreements by common accord, in light of changing circumstances. Additionally, international law and practice recognize the right of government to impose severe sanctions such as cancellation or annulment of contracts if it is determined that (i) the contracts were entered into under fraudulent circumstances; (ii) are so unbalanced as to fundamentally prejudice the rational exploitation of the mineral deposit and equitable distribution of benefits arising there from; or (iii) the contracting parties are not honoring their commitments in terms of work program and expenditure minima[40].

An inter-ministerial commission was established in May 2007 to re-read approximately 60-63 contracts between state-owned enterprises and private companies. It was established to follow up on the commitment made by the Government during the election process to review the mining contracts. The commission is composed of about 30 members drawn from the President's office; the Prime Minister's office; the ministries of Mines, Finance, Budget, Justice, Portfolio, and Industry; and other agencies such as the Mining Cadastre. The commission is working under the direction of the Ministry of Mines and has issued its report and recommendations in early November, 2007. After some initial confusion, the commission has examined the contracts in a diligent and responsible fashion. Members have traveled to inspect various partnership agreement sites and most private sector companies have cooperated with the commission's work. Representatives of civil society have also been invited to attend the commission's work sessions as observers and have been allowed to make submissions. According to reports in the local and international media, the commission recommends that 2/3 of the contracts be renegotiated and 1/3 be cancelled. The commission's report and recommendations will be transmitted to the Government through Minister of Mines and his cabinet. The government will then decide how best to proceed with subsequent discussions with the companies with a view to correcting the perceived deficiencies.

[39] The Lutundula Commission singles out the MIBA-Senegamines contract in this respect, stating that it has evolved on the margins of the law with numerous irregularities. Global Witness cites the case of the conflict of interest involved in the granting of a mineral right for cobalt owned by GECAMINES to Congo Cobalt Corporation (CoCoCo), a company controlled by Mr. Billy Rautenbach, who at the same time was chief executive officer of GECAMINES. However, the Lutundula Commission finds that the CoCoCo is functioning normally and in accordance with the law.

[40] Frequently, these mineral rights holders are simply speculating with the mineral right itself or on the international stock markets without performing any serious exploration or development work on the property.

The contract review and any discussions relative to revisions of them need to be handled with care. In this respect, a number of concerns have been raised concerning the workings of the commission and the follow-through on its recommendations. The Government has not announced the criteria by which the contracts were selected for review or the criteria by which they have been judged. Many agreements have international arbitration provisions which, if applied, could involve the Government in years of costly arbitration proceedings. The commission's rereading of the contracts has already had a destabilizing effect on the international markets where companies raise capital for investments in Congo. Financial institutions and underwriters of mining investments have been waiting to see what happens while the contracts have been under review and will delay longer to mobilize finance for development as long as the government is discussing with the companies fundamental adjustments to the contracts. There is concern that final decisions could be made on a political patronage and non-transparent basis. To mitigate this risk the idea to appoint an independent outside observer for the commission's work has been advanced. However, the organizations noted in the press, such as the Carter Foundation and the Open Society Forum for Southern Africa, are involved in advising civil society organizations and their role as independent an impartial observers is open to question and unclear. Nor is it clear what access the commission has had to expert legal advice to assist in evaluating the contracts. In the interests of transparency and absolute fairness to all parties, it would be advisable for the government to disclose the terms of reference for whatever legal assistance it requires for discussions with the companies and to recruit competent advisors through a competitive process.

Other issues could arise concerning the manner in which the commission has arrived at its recommendations. If the commission has not had access to sufficient technical expertise there is the risk that recommendations could be based on interpretations which are contrary to standard practice in the mining industry. For instance, appraisal of the value of a deposit and the percentage shares of the State and the private company in the partnership and/or the *pas de porte* (signature bonus) to be paid by the company should take into account geological and technical risks, capital and the operating costs, and the discounts associated with extracting saleable mineral product. Any recommendations concerning royalties and taxes should conform to the stipulations of the Mine Law of 2002 in respect of the rates proposed or the basis of calculation.[41] Care should be exercised in respect of recommending an increase in the participation of the State entity in the partnership. As indicated below, shareholdings by State entities in partnership agreements may not produce the financial returns anticipated and could make it difficult for the State to exercise its role as impartial regulator of potential conflicts between the company in which it has a shareholding and the communities where the mine operation is located. The legitimate concern to increase effective participation of the State entity in the management of the partnership could better be addressed by improving operating agreements, accounting and financial procedures, and the protection of minority shareholder rights. It is also important to note that the Mine Law provides for tendering of mineral properties. To the extent that a partnership agreement has been cancelled for cause (as, for instance, non performance of work obligations, in accordance with the terms of the contract) and such cancellation results in the freeing up of a mineral resource, the Government should conduct a tender operation to ensure transparency and best market value for the resource. Finally, the Government also needs to guard against possible corrupting influences or

[41] For instance, the Mine Law of 2002 (article 242) stipulates the applicable percentage rate of the royalty be calculated on the basis of the realized sales price less intermediary charges (transport, assaying, insurance, marketing charges) rather than the gross sales value.

inappropriate practices within the commission itself and in subsequent discussions with the companies. This is a serious issue for which unfortunate precedents exist in DRC, as evidenced by the unauthorized fees exacted by the *Commission de Validation des Titres*.[42]

Specific Contract Issues

Specific criticisms of the contracts have been documented by the Lutundula Commission report,[43] various studies undertaken by private non-governmental organizations,[44] and legal and financial reviews of some contracts undertaken by outside consultants to the Government, with funding from the World Bank.[45] The questions related to the contracts concern: first, whether the processes followed to negotiate the contracts were transparent; and second, whether the terms and conditions of the contracts provide any real benefits to the Government and people of Congo.

On the Processes Followed

There were a number of weaknesses in the way the agreements were negotiated, including lack of transparency, no competitive bidding process, and no rational attempt to package the assets so as to maximize their value. In most instances, there was no appraisal and valuation of the mineral assets to be granted to the private company; and some companies received mineral resources that were too large for a single company to rationally exploit, given time

[42]The Mine Law of 2002 established a *Commission de Validation des Titres* to adjudicate conflicts regarding mining titles, many of which were granted by provincial authorities during the conflict years, even though they had no statutory authority to do so. As per the requirements of the Mine Law, a list of the disputed mining titles was published in 2003 and the *Commission de Validation des Titres* was established by the Mine Law to arbitrate the conflicts. However, some unfortunate practices have been alleged regarding the Commission's work. First, funding of the Commission was never specified or budgeted in the government accounts. As a result, the Commission was delayed in starting its work until set-up funding could be mobilized through the World Bank. Second, the Commission, without authorization of the government, requires each party to the arbitration to pay US$ 10,000. This clearly raises issues of equitable treatment of mining title holders since the smaller holders may not be able to pay the fees and hence forfeit their rights under the law. Third, the Commission continues its work in spite of the expiry of the initial time frame established in the implementing decree (three months plus one month extension). Hence, the legality of decisions taken after the effective date is open to question. Finally, and most seriously, it is alleged that the commission is not limiting its work to the mining titles established in the master list but accepting to arbitrate titles which are claimed in conflict by various operators. This opens the possibility that certain operators will instigate proceedings simply as a means to encumber mining titles and extract payments from legitimate title holders. An arête of the Minister of Mines in August, 2007, has suspended the work of the commission de validation and declared null and without effect any decision of the commission past the original closing date for its work in February, 2007.

[43] *Assemblée Nationale Commission Spéciale Chargée de l'Examen de la Validité des Conventions a Caractère Economique et Financier Conclues Pendant les Guerres de 1996-1997 et de 1998, 26 Juin 2005.*

[44] See "Digging in Corruption" by Global Witness, and publications of Rights and Accountability in Development (RAID-UK).

[45] Legal review by Duncan-Allen (Washington DC), and financial review by Ernst & Young (France), of GECAMINES contracts, funded by the Competitiveness and Private Sector Development project of the World Bank. These legal and financial/economic studies were underway in 2005 when the Government authorized the signature (July 2005) of certain partnership agreements without waiting for the results of the studies. These partnership agreements transferred nearly 70 percent of GECAMINES' productive assets to the joint venture companies set up under the partnership. The data made available to the Ernst and Young study team for the economic and financial analysis were not the most recent data, and did not necessarily reflect the position of the enterprises under market conditions at that time.

and financial considerations. Further, the legal and financial terms and conditions of the contracts were not reviewed before their signature.

On the Terms and Conditions of the Contracts

- In all of the contracts, the state enterprise has a minority shareholding position, generally around 20 percent. This is not unusual in terms of international practice, but if the state enterprise's shareholdings are "carried" or subject to shareholder loans, the interest rate and other financial terms and conditions could pose significant conflicts of interest, or be on terms highly unfavorable to the state-owned enterprise. A critical issue with respect to such shareholding is the need to specify and improve the internal governance procedures in the partnership contracts, particularly with regard to protection of minority interests, voting procedures, organizational structures, decision making rules, mandates of officers and directors, and accounting and financial management procedures. In many of the contracts, management and operating agreements are absent. Generally, the operating agreement specifies the duties of the operator, budgeting and approval processes, the scope and limitations on authority, the percentage and basis for remuneration, and other matters pertaining to the internal operation of the partnership.
- Some of the contracts signed before the Mine Law of 2002 are legally grandfathered, according to Article 136 of the Law, provided that the mineral rights have been validated under the terms and conditions of the new Mine Law.
- The financial and technical capabilities of some companies to fully honor their contractual obligations have been questioned, though many other appear to be honoring their obligations.
- Various encumbrances and competing claims on the mineral assets and/or plant and equipment may not have been fully disclosed.
- Transfer pricing is a concern in some of the contracts.[46] Transfer pricing involves selling of mineral product between related parties on a "non arms length basis" in order to avoid tax liabilities
- Environmental liabilities have not been fully evaluated, and responsibility for them has not been defined. In many contracts, the state-owned enterprise (GÉCAMINES, for example) remains responsible for the financial liabilities attached to the transferred mineral and producing assets. This is not in line with standard practice; normally, some form of compensation or assumption of these liabilities by the companies would be specified in the contracts.
- There may be significant conflicts of interest in the contracts, with the partners also being the suppliers and/or vendors of goods and services.
- The state-owned enterprise may not be able to recover its mineral right in case of dissolution of the joint venture. It would have been preferable to lease the mineral assets rather than transfer them into the name of the joint venture

Role of Infrastructure

The lack of infrastructure is a principal constraint to the development of mining in DRC. The country is essentially landlocked and must rely on neighboring countries for the import of heavy plant and equipment and the export of mineral commodities. Long distances to seaports, combined with badly deteriorated (or nonexistent) roads and railways in the mineral

[46] The GTL/STL contract for the processing of the cobalt scories in Lubumbashi possibly has transfer pricing issues associated.

producing areas, greatly increase the cost of production, which puts Congo at a competitive disadvantage on the international market. Energy and power are also highly problematic. Many of the generating plants in Katanga and elsewhere are old and do not have sufficient capacity to produce the power required by the growing industry. To address these issues, the Government is developing plans to restructure and/or privatize the state railway and power companies. Also at issue is the lack of an appropriate regulatory framework for the private ownership of heavy infrastructure.

Transport Infrastructure

The collapse of the transport system in DRC is a result of the deterioration of both physical infrastructure and the poor performance of technical institutions in charge of its management and maintenance. None of the technical institutions function at the levels required to adequately manage the transport system, and in particular to ensure its maintenance. This is mostly due to a lack of financial resources for ten consecutive years, which has resulted in outdated technical knowledge and management tools, lack of equipment, and drain of qualified and experienced staff. Institutional strengthening is therefore vital for the long term sustainability of any newly rehabilitated infrastructure in DRC and for associated activities such as environmental protection.

The transport sector in DRC depicts the variety and the immensity of the Congolese countryside by relying on different transport modes. The Congo River and its feeders constitute a major artery in this system linking the economically dynamic Matadi-Kinshasa axis to the northern regions of the country. The railway spreads out the South-East of the country, connecting the mining regions with the rest of the continent. In this context of isolated transport corridors, the road network was designed to unite the country's regions by linking the East to the West and the North to the South.

Maritime and River. The maritime sub sector is driven by three seaports located in the mouth of the Congo River (Matadi, Boma and Banana). The port of Matadi is the largest and accounts for 95% of the traffic (about 1.8 million tons in 2006), most of which is transferred by road or rail to Kinshasa. The capillary network of 16,238 kilometers of navigable rivers and lakes is not as exploited as maritime transport. Due to the lack of infrastructure and equipment, only 4,000 tons transited through DRC's 40 river ports in 2004. It however remains a vital link for many remote inland provinces like Equateur and Maniema where habitat is concentrated around rivers.

Rail. DRC has an extensive but scattered rail network of 5,033 kilometers which dates mainly from the colonial era. It has three major sub networks: Matadi-Kinshasa, in the north (Kilomoto) and in the southeast (Katanga and Kasai). In addition, the Benguela railway in Angola has in the past been a critical transport link for Katanga minerals production. This railway is being rehabilitated by the Chinese. Two government agencies, ONATRA (the National Transportation Office) and SNCC (the National Railways Company), are the largest state railway operators. However, of the combined total of 5,033 kilometers of railways only 950 kilometers (18 percent of the total) is in good enough condition to permit regular transport. The rest of the rail system is inoperative. SNCC operates railway lines in Katanga, the two Kasais, and Maniema. In other provinces, with the exception of ONATRA in Bas-Congo, the rail system is nonexistent. The SNCC rail system is linked to systems in Zambia, Tanzania, and South Africa. SNCC is particularly important for Katanga minerals production, notably on the axis Kipushi-Lubumbashi-Kolwezi. Because of the poor condition of the rail system and the shortage of functioning locomotives, the average speed is 10-35

kilometers per hour. One in three trains derails, and the cost of repairing the damage is around US$20,000 per incident. Approximately 860 kilometers of the SNCC system is electrified. This electrification system is more than 40 years old and frequently breaks down, affecting the movement of all trains along the line. A plan to rehabilitate 1,560 kilometers of the SNCC rail system will cost an estimated US$420 million, or US$270,000 per line kilometer.

Air. DRC's air transport prevails as the best means to connect some precluded regions to the country's capital and is currently vital to domestic trade. The country comprises a total of 270 public and private airfields, only 5 of which are international airports – namely Kinshasa, Lubumbashi, Kisangani, Goma and Gbadolite. Despite the unsafe carriers (all the country's airlines are on the EU blacklist), the aging infrastructure and the deficiencies in airspace management, air transport has benefited during the years from a transfer of traffic from the road because of the critical state of the road network. It is however expected that a significant traffic share of this highly expensive and hazardous transport mode will be shifted back as the domestic road corridors are rehabilitated and some regions' accessibility is restored.

Road. Despite the multimodal nature of DRC's transport sector, roads remain the country's core transport mode, as essential in national and international corridors as in providing basic rural access. Its 152,400 km network covers the entire country and can be divided in three categories:

- 58,385 km of national roads, only 2,801 km of which are paved and can be found along the Matadi-Kinshasa-Lubumbashi corridor (RN1). In order to sequence the road works by order of importance, the Government classified 23,140 km of this national network as priority roads, among which 15,871 km are considered high priority;
- 86,615 km of rural access or local interest roads; and
- 7,400 km of urban roads.

All these roads differ not only by their category but by their condition. On the whole, their state has deteriorated to the extent that the accessibility of social and economic centers has been impeded. Only 5 to 10% of the roads are in fair to good condition, the rest is impassable, stripped from all signaling and in need of rehabilitation Moreover, most of the high-priority roads currently look like poor tertiary roads and motorized traffic, except for two wheelers, is most often close to impossible. For industrial producers, lack of road infrastructure increases costs to deliver mineral product to the customer and also puts the enterprise at risk of not meeting contractual marketing agreements. Artisanal producers are especially dependent on adequate road infrastructure. In the east of the country, in particular, lack of viable routes to the artisanal mine sites frequently means that artisans are at the mercy of various middlemen and militias who control the air or other transportation routes.

Road Sector Institutional Framework. The Ministry of Transport and Communications ensures the oversight and the coordination of the transport sector. However, given the large extent of the road infrastructure, two additional ministries are actually the main protagonists in the road sub sector: the Ministry of Public Works and Infrastructure administrates national and urban roads while the Rural Development Ministry administrates the rural roads. Two administratively and financially independent entities manage the roads within the Ministry. The Office des Routes manages the national roads and the Office des Voiries et Drainages the urban roads. The Office des Routes was created in 1971 by the Ministry of Public Works and Infrastructure with the mission to manage the national road network. Even though its

activities were greatly reduced during the decade the Office still managed to retain its qualified personnel and human capital. Today, the entity stands as a valuable source of technical knowledge widespread across the country. In 2001, DRC entered a phase of national reconstruction stating infrastructure rehabilitation as a priority. By 2004, the primacy of the Ministry of Public Works was restored and led to the creation of the Cellule Infrastructures within the Ministry. This entity's role is to provide institutional and technical support as well as rebuild capacity within the Ministry.

Since 2004, as part of contribution to the Government's national program for economic and social revival, the international donor community has committed about US$750 million for road construction and rehabilitation[47]. In addition to donors, considerable scope exists for government and the private sector companies active in the mining sector to work together to build and/or rehabilitate necessary infrastructure. There is ample international experience of successful public-private partnerships (PPPs) in the sector. For instance, the development of railways and port infrastructure to open the coal mines in Queensland, Australia for commercial exploitation during the 1970s was funded by private companies, which then managed the facilities on behalf of the Government. Other partnerships use dedicated mine infrastructure within the larger development context, as, for instance, the building of a port in southern Madagascar which is linked to development of an illmenite mine. In Katanga, there are ongoing discussions with companies and the provincial and national governments about what kinds of partnerships in infrastructure might be developed. The provincial government has asked the for the companies to fund specific infrastructure projects, such as the rehabilitation of the runways at Lubumbashi airport, but no concrete steps have been taken toward finalizing a contract

On September 18, 2007, DRC signed a $5 billion financing agreement with China, whereby China would pre-finance and execute massive investment in paved roads (Kisangani – Bunia –Beni - Kasindi; Beni – Goma – Bukavu - Uvira, Lubumbashi ring road, Lubumbashi – Kasumbalesa, and Kolwezi – Likasi) and rail roads (Sakania – Lubumbashi – Mwene Ditu - Ilebo, Lubumbashi – Dilolo, and Kinshasa – Matadi, and possibly greenfield tracks between Ilebo and Kinshasa and between Matadi and Banana). These investments would come along with investments in public buildings (universities, schools, hospitals), and creation of Sino-Congolese joint ventures. USD 3 billions would fund the above infrastructures whereas $2 billions would be invested in four mining sites to be concessioned by DRC to Chinese firms as part of the agreement. The revenues from the commercialization of these mines would allow China to recoup its investments and financing costs. This agreement was prepared rapidly and discreetly and it is too early to assess the impact it will have on traditional donors' programs and this project in particular.

Power

The state company, SNEL *(Société Nationale d'Electricité)* has a monopoly on electricity, and under its control, DRC's electric generation and transmission facilities have severely degraded. In particular:

- Many of the electrical generators and hydroelectric facilities operated by SNEL in Katanga and Bas-Congo are off-line;
- Civil works and electromechanical supporting infrastructures are degraded;
- At the Inga hydroelectric dam; capacity is reduced due presence of silt and mud in the feeder channels;

[47] See annex 8 for a list of donor funded road rehabilitation and construction projects in DRC.

- Equipment at many installations is outdated, and unable to meet modern requirements.

4. Role of the Artisanal and Small-Scale Miners

Artisanal mining is the largest segment of the DRC mining sector and the one which has the highest impact in terms of production as well as persons involved. This sector is dominated by a number of problem areas, including relations between artisans and large-scale mines; exploitation of vulnerable populations; extortion by government officials and criminal elements; lack of health, safety, or environment protection; and inadequate legal protection and government assistance for the miners.

It is estimated that 90 percent of minerals production in DRC comes from artisanal miners.[48] Estimates vary on the number of artisanal miners in DRC: 500,000 to 2,000,000 diggers *(creuseurs)* are thought to be actively and directly involved in extraction of minerals. With an average of four to five dependents for each digger, the total number of persons whose livelihood depends on this activity for could be as high as 8 to 10 million – or 14 to 16 percent of the total population of Congo.

Artisanal mining issues are of keen interest to the international donor community, given the obvious linkages to the overall poverty reduction agenda. A multi-donor workshop held in Kinshasa in August 2007 focused on what could be promising interventions in the sub-sector. The workshop will be followed later in the year by a larger conference which will suggest more specific interventions for the government and the donor community in the artisanal mining sub-sector.

Artisanal and small-scale mining takes place in virtually all of DRC's mineral producing areas.

- *Gold* is mined by artisans principally in the east of the country (Orientale, Ituri, Kivus). Exports of gold from artisanal sources in these areas are estimated at 8,000 kilograms per annum, having an export value[49] of US$125 million. Gold exploited in Ituri/Orientale is estimated at 65 percent of total DRC gold production. If this is the case, then the country could be producing as much as 12,000 kilograms, with a market value (calculated on the same basis) of US$187 million. Much of the gold produced by artisans in Ituri and Orientale is allegedly smuggled across the border to Uganda and other east African countries and thus does not attract the rates of royalties or other taxes provided for in the Mining Code. In fact, when compared to official statistics of gold production (around five metric tonnes), it would appear that more than half of DRC gold production is smuggled out of the country. The average annual income of the artisanal miner is estimated US$1,600 per annum, though costs associated with the work would significantly reduce the amount of money in pocket. This income is less than that of the artisans in Katanga.

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[48] The nature of artisanal mining makes it very difficult to obtain reliable information. Information on the quantity and value of artisanal mining production, as well as the number of artisans, has been compiled from a number of sources, including government statistics, UN Security Council reports, various donor-supported (DFID, USAID) studies, and studies of various NGOs such as Global Witness. Production volumes have been balanced with official statistics (USGS, BGR) and sectoral reviews (Goossens).

[49] In the case of gold, the average export price is US$500/ounce, or 85 percent of the international price if taking into account transport, smelting, and refining charges.

- *Cassiterite* is exploited by artisans in the Kivus. Statistics on cassiterite production are particularly difficult to obtain, though some sources have estimated about 8,000 metric tonnes per annum, with a total export value of US$48 million. The cassiterite is exported principally to Rwanda. The artisanal miner earns around US$800 per year for his labors, much less than artisans in Katanga or Kasai Orientale province. This amount represents about a quarter of the value of the artisan's production, allegedly due to extortion of production by the FARDC, the Mining Police, various militia groups, and local authorities. The number of persons involved in cassiterite mining is not known. However, during the coltan boom of 2001, it is estimated that 10,000 to 12,000 artisanal miners were active in the Kahuzi Biega national park alone.
- *Diamonds* are mined by an estimated 700,000 to 1,000,000 artisans, principally in Kasai Orientale and Kasai Occidentale. In 2005, the Kimberley Process recorded production of diamonds of 33 million carats (of which 26 million carats were from artisanal producers and 7 million carats were from the state-owned enterprise, MIBA), with a gross market value of US$613 million. Around 94 percent of DRC diamonds are of industrial, rather than gem, quality. Since gem-quality stones could attract a price as high as US$100+ per carat (versus US$12 per carat for industrial stones), it is not surprising that the most valuable stones are never declared to the authorities. Considering that artisanal miners target mainly gemstone quality diamonds[50] and realise an average sale price of US$30 per carat, they annually produce approximately 60 million carats. This figure is in accordance with the CEEC's statement that the Kimberley Process only catches 60 percent of the country's production, by volume. The volume of production would increase considerably if lower sale prices are assumed. However, according to the official figures of CEEC, artisanal diamond production had an average value of US$29.58 per carat in 2006. Yet, as undervaluation is a common allegation, the true sale prices are likely to surpass the official numbers.
- *Heterogenite* (25 percent copper, 10 percent cobalt) is produced by an estimated 150,000 diggers, principally in Katanga (estimates range from 50,000 to 250,000). The artisans at present produce in excess of 80 percent of the 259,967 metric tonnes of copper and 138,773 metric tonnes of cobalt, metal, or metal equivalent contained in concentrates, officially exported from Katanga in 2006. The artisans work frequently on mining concessions held by other parties and sell their product, through intermediaries, to a number of foundries or beneficiation plants established in Katanga by various trading companies. These artisans can earn as much as US$2,200 per year.

Issues

Conflicts between artisanal and industrial producers are the Achilles heel which jeopardizes the future of mining in Congo. In Katanga, thousands of artisans have invaded the concessions held by GÉCAMINES and other companies. They extract the highest and best grade heterogenite and copper ores and sell to various intermediary and smelting companies operating in the province. Many projects in operation or under feasibility study must consider how to remove the artisans from the concession area scheduled for industrial mining operations. Forced removal of the artisans has caused significant strife in Katanga. In Kasai, incursions onto the polygone, the principal diamond concession of state owned diamond

[50] This not only makes economic sense for the artisan but is also due to the type of deposit which is exploited – river gravels or detrial – where the concentration of gem quality stones is higher.

producer MIBA, is a significant problem and has led to violent confrontations between the company's security forces, the police and army, as well as violent confrontations among the artisans themselves. Companies such as DeBeers and BHPBilliton, which are exploring and considering industrial operations for diamond mining in Kasai, are concerned with the reputational risk to their worldwide operations in the event of conflict with the artisanal miners.

A project is currently under implementation (funded by DFID, USAID, and some companies) to work with companies on human rights and security issues in and around mine sites, with a view to applying best practice on issues of relocation and handling of conflicts. Additionally, DFID is proposing some work on developing alternative sources of livelihood to entice the artisans away from industrial mining areas and concessions held by the companies. Though this initiative is promising, it is too early to judge how successful it can or will be. There is not a great deal of experience with this approach in other countries. The difficulties of making an artisanal miner into a farmer or construction worker are primarily economic: in spite of the dangers and dismal working conditions in the artisanal mining sites, the artisan believes that he can strike it rich. Indeed, the average remuneration for artisans in the principal mining areas is significantly higher than the GDP per capita or the revenues that a miner could earn in farming or some other occupation. Even if some artisans could be enticed into other occupations, such as construction work or small business, the artisans are too numerous and these alternatives too few for the alternative livelihoods approach to be sustainable over the longer term.

Vulnerable populations: children and women. It is estimated that children comprise 40 percent of artisanal miners or are present on artisanal mining sites as members of the family. Child labor laws exist in DRC but they are not enforced (nor, under present circumstances, are they enforceable). The children, in addition to being helpful at extracting the minerals, have no alternative activity. Schools do not exist or are too distant. If all members of the family are working, then there is no one available to care for the children. A number of international NGOs are active in trying to remedy this situation.[51] Women represent around 20 percent of those present in the mining sites, with or without the husband or other family member. Some women lose their husbands to accidents and stay in the mining camps because they have no other source of livelihood. They are engaged in petty trade but are also sometimes forced into prostitution. They are also prone to family and/or sexual violence and abuse.

Health, safety, and security issues are principal areas of concern in the artisanal mining camps, as is the case in other countries. Artisans have limited or no access to health care providers. Most clinics or dispensaries are many kilometres from the mining site. Government health workers rarely, if ever, visit the sites due to lack of transportation or difficult logistics. The incidence of sexually transmitted diseases is reputedly high because the camps are often populated by itinerant young men without their families. The camps are wholly lacking in sanitary facilities, safe drinking water, and hygienic conditions for food preparation and consumption. The miners lack even rudimentary safety equipment such as proper footwear, hardhats, and protective eyewear and clothing. Working conditions are exceedingly dangerous. They descend into pits galleries without proper shoring or

[51] For instance, the program of Groupe One, supported by UNICEF and the Belgian government, aims to prevent child labor in the heterogenite artisanal mines in Katanga, by developing sustainable alternative sources of livelihood for them or sending them to school.

ventilation. Cave-ins and suffocation cause many deaths, though there are no reliable statistics.

Extortion by Government officials. It is alleged that members of the National Security and Information Service, the National Police, Army, Mining Committee, Division of Mines, and SAESSCAM all enter the artisanal mine sites and extort payments and/or sacks of diamond-bearing gravel. In the east of the country, it is alleged that the national army has simply replaced the warlord militias in control of some of the gold and cassiterite camps, extorting production from the miners and smuggling the production across the border. In Katanga, there are frequent allegations that various government officials, as well as officials of EMAK (the miners association) are also involved in shaking down artisanal miners on site. Once the artisan sells his product to the *négociant,* broker, trading house, or *comptoir,* these intermediaries are also subject to numerous extra-legal payments demanded by various layers of officialdom to transport the product and authorize it for export to the final market. It is possible to roughly estimate the value of this extortion by taking the diamond sector as an example. At a typical *drague* (the dredge which excavates gravels from river courses) operation in the Kasai, approximately 50 sacks of diamond-bearing gravel are produced per day. While the diamond content (in terms of carats and value) varies, each sack is possibly worth US$30, depending on whether it is of industrial or gem quality. Of the 50 total sacks of gravel produced, as many as 30 sacks will be given over to various officials and other predators: 60 percent of the value of the daily production.

Box 3. A Day in the Life of an Artisanal Miner

The work day starts early at the artisanal mining camp; sometimes it continues for 12-14 hours a day, 7 days a week. The miner may be from a local village (with or without his family members) who digs on a seasonal basis as a source of supplemental income. Or, the artisan may be from outside the vicinity, often an itinerant young man out to strike it rich. In the diamond sector, teachers, government officials, and army personnel are also artisanal miners. When the miner arrives on site he will find a plethora of problems. Safety procedures and equipment are either non-existent or not used. The work is extremely arduous and often dangerous; numerous deaths occur in mine shafts due to cave-ins or suffocation. Proper hygiene and sanitary facilities and practices do not exist. In many cases, the artisanal miner must bring his children onto the mining site because they have nowhere else (e.g., school) to go and because an extra pair of small hands are especially good at getting into small crevasses. Work at the site is highly specialized, with diggers (men), carriers, crushers, and washers (mostly women and children). Sometimes, especially in the heterogenite artisanal mines, the digger is a day worker employed by a company, many times in violation of the labor laws. The digger will work in a team of 5 or 6 others to open a shaft or pit to expose the ore-bearing strata. There is a significant risk that the ore-bearing strata may not be encountered, in which case the digger team will have wasted its time and energy. Oftentimes, government officials arrive at the mine site to extract payments or product in kind from the miners. In the eastern part of the country, in particular, militias or regular army units are on site to extract their payments, and officers are alleged to be principal middlemen in clandestine export of the product to Uganda, Rwanda, or Burundi. Thus, the sales price of the product upon which the miners' livelihood depends must be high enough to support the numerous payments and "tolls" at the border, which exceed those authorized by the law.

Artisans have no legal mineral rights under the Mine Law. Instead, the provincial authorities issue a "diggers card" *(carte de creseur),* which costs the artisan US$25 per year and

authorizes the digger to mine within a certain zone. In reality, virtually no artisanal miner possesses the card. Even if they recognize the legal requirement to have the card, they are unable or unwilling to pay US$25 to obtain one. Furthermore, the card is valid for a certain zone, while the miners are mobile and migrate from zone to zone. Also, the authorization is subordinate to a mining right (exploration or exploitation permit), and thus companies can (and frequently do) take over permit areas which are actively worked by artisans. It would be more logical to make the card valid for the entire province. While the amount of taxes the government could collect if all the artisanal miners were to pay the US$25 annual fee is not negligible (assuming one million miners, this would amount to US$25 million per year), in reality there is simply no way to force the artisans to pay this fee. It is recommended that the government drastically reduce this fee and make the cards accessible to the miners at nominal cost. Having the miners properly registered with the authorities as a means of controlling fraudulent activities would seem a more important priority than collecting taxes from the lowest levels of the mineral production chain.

Artisanal miners' cooperatives. Artisanal miners frequently work for others who hold mineral rights. In Kasai Orientale, for example, nearly all of the artisans surveyed said that they work in a mine titled to another person or entity. Organizing the artisans into miners' cooperatives has been suggested as a means of providing them with better technical assistance and extension services. The Mine Law of 2002 provides for small-scale mining rights, but they are granted only to entities having juridical personality, and to individual Congolese nationals having proof of sufficient financial capacity. A small-scale exploitation permit grants exclusivity over a certain area for mining activities for 10 years, thus facilitating the mobilization of capital investment and giving the artisanal cooperative sufficient time to install larger-scale mining equipment. However, the Civil Code does not recognize artisanal mining cooperatives as having a juridical personality, and would have to be revised to allow cooperatives to obtain small-scale mining permits. The Ministry of Mines has prepared an *arête* as well as other legislative texts to allow the formation of artisans' cooperatives.

Attempts have been made in DRC to organize the artisans into more effective groups as a means to achieve higher productivity and to negotiate better commercial terms. However, to date these efforts have had very limited success. Though a miners association (EMAK) exists and is officially recognized by the State as a labor organization, there are many complaints that EMAK extracts payments from the artisans and does nothing useful. Finally, results in other countries with artisanal miners' cooperatives have been mixed. Success in artisanal cooperatives is related to the artisans' level of sophistication and experience with mechanical and quasi-industrial processes. For instance, artisanal mining cooperatives in Peru, Ecuador, and Northern Chile, where miners have a long tradition of mechanized mining and some technical training, have been more successful than cooperatives in West Africa, where the level of sophistication with mechanical processes is much lower.

Financing of artisanal mining operations is complex but reasonably straightforward. More than half of the artisans in the diamond sector are financed by various *négociants* (diamond buryers, traders and brokers). The other half are funded using their own funds or in association with the *négociants* or others. The excavation necessary to reach the diamond-bearing gravel layers can take several days or even weeks. During this work, the miners need sustenance and equipment, which is funded by the *négociants.* Thus, the *négociants* provide the risk capital necessary for the process, not unlike industrial-scale operations, where mining houses and their financiers provide risk capital for exploration and development. As compensation for this funding, the *négociant* in the diamond sector will typically require in-

kind payment of 50 percent of the production (sacks of gravel). Additionally, the *négociant* will purchase from the artisans the diamonds they extract from their share of the gravel. However, since the price paid to the artisans is fixed by the *négociant,* the artisans have no way of knowing the value of the stones. Artisans could earn as much as US$800-$1,000 per year after costs.

Lack of effective government oversight and assistance is a fundamental problem in the artisanal camps. *SAESSCAM* is the government body designated to assist the artisans with organizational and technical issues. SAESSCAM is present in some of the camps, and the artisans appreciate its efforts at organizing and improving production techniques. However, SAESSCAM does not work with all artisanal or semi-industrial producers or dragues. In the small-scale diamond sector, 26 out of 145 operators in Tshikapa work with SAESSCAM; in Mbuji-Mayi, none of the estimated 50 operators cooperate with the service. SASSECAM does not have sufficient logistical support in the small-scale and artisanal mining areas, nor are the most of its personnel skilled in specific artisanal and small-scale mining issues. Several factors make it difficult for the Government and/or SAESSCAM to effectively intervene in the sub-sector. Workers are paid in sacks of gravel, which renders accurate production statistics difficult to acquire; and the companies for which they work often operate on concessions or permits which belong to other persons, for which the lease payments vary between 20 and 40 percent of the gravel mined. Finally, in addition to the payments to the permit holder, the companies need to share gravel with customary chiefs (10 percent), various government services (10 percent), and in the case of dredge operations, with the dredge operators (20 percent).

Artisanal mining zones. The Mine Law of 2002 authorizes the Ministry of Mines to designate zones reserved for artisanal miners. Experience with these zones has been disappointing. In the two Kasai, no such zone has been designated so far, forcing all artisanal activities into illegality. In Katanga, 150,000 were supposed to occupy six zones which were created in 2005. But, five of the zones had closed one year later due to economic and technical difficulties. The one zone presently operating is too small a surface area to accommodate the miners and, in any event, the zones are some distance from urban centers and transport infrastructure. It has been difficult to encourage the artisans to move to these sites, given the difficulties of access, and additional time and effort required. Another issue is the practice, especially prevalent in 2002-2005, of personnel from GÉCAMINES "selling" permissions to artisanal miners to work on GÉCAMINES mining licenses. In principle, CAMI should record the artisanal mining zones to the extent that they have been designated. It is not clear whether the areas being worked by the artisans outside of an authorized zone were recorded by CAMI; and even if they were, absent designation as a zone, the permit would hold supremacy.

Artisanal producers of heterogenite sell their production to *négociants*, which then sell onwards to buying houses. The buying houses – such as Bazano (Lebanese), Chemaf or Somika (Indian) – either export the material in raw form through Zambia to destinations such as South Africa, China, India, and Malaysia or beneficiate the material at small foundries established in recent years in Lubumbashi, Likasi, Kambove, Kakanda, and Kolwezi. As previously noted, a legal issue pertains to whether these enterprises should be under the terms of the Mine Law or some other industrial legislation.

Clandestine exports. Illegal exportation of minerals is not, strictly speaking, the work of the artisans but rather the intermediaries and middlemen to whom they sell their production (*négociants, comptoirs,* armed militias, Congolese military). The points of exit from the

country are not numerous (around eight major exit points), and it would in theory be possible to establish greater government controls at the frontier posts. However, so far the Government has been unable or unwilling to do so. For instance, the report of the UN Panel of Experts[52] indicates very low levels of controls at Congolese border posts and airports in the east of the country. High-value, low-volume commodities such as diamonds and gold can be transported directly from airports in these areas to terminal markets (such as Dubai or Belgium) through Kenya, Burundi, or Uganda. The Kimberley Process has had some success in reducing the clandestine export of diamonds; however, an estimated 30-50 percent of diamond production by value is exported from DRC without proper declaration or valuation. Of interest as well is the study on trade routes currently under preparation by a team funded by DFID, USAID, and COMESA. This study is to be released before end-2007. The study examines the trading volumes, values, and commercial circuits of all commodities in the eastern zones of the country.

[52] "Final Report of the Group of Experts on DRC Pursuant to Security Council Resolution 1698 (2006)," S/2007/423, Jorge Voto-Bernales; Deguene Ka, Ibra; Carish, Enrico; Cissoko, Abdoulaye; and Huxford, David.

5. Social and Environmental Aspects

Providing Social Services to Local Communities

The decline of state-owned mining enterprises has had a profound impact in terms of provision of social and infrastructure services in the local communities where the companies have operations. Over the many years that the companies have been in operation, essential services were provided to the workers, their dependents, and to the community at large. These services were extensive and included support to schools, medical facilities, recreational facilities, essential infrastructure such as electricity and water, housing for workers and families, and direct financial support to the municipal government. The system worked well enough to provide a reasonable standard of living for the communities during the colonial and immediate post-colonial period. However, as the production and revenues of the enterprises declined, the burden of providing these social services has become a significant constraint. This situation was exacerbated during the civil war and subsequent political instability. MIBA, for instance, reports that 40 percent of its operating costs is for the supply of power to the city of Mbuji-Mayi and environs. Similarly, GÉCAMINES' support of social and infrastructure services became an unsustainable expense as the enterprise's production and revenues declined. Maintenance of infrastructure and investment in supplies were neglected. Hospitals and schools, deprived of funding from the enterprise, began to charge fees for their services, a significant additional expense for employees who were not paid on a regular basis.

Several issues merit consideration relative to continued support for social services by state-owned enterprises.

First, the production levels presently achieved by the enterprises are not sufficiently large to permit continued expenditures for social services. For instance, in the case of GÉCAMINES, social commitments could be supported when the enterprise was producing 400,000 metric tonnes of copper per year, but it is not commercially viable to support these services under the planned restored production of 30,000 metric tonnes per year. It has been envisaged to spin off the education and health facilities of GÉCAMINES as part of the restructuring of the enterprise. However, studies of how to accomplish this have yet to be completed and, in any event, it is unclear which entity (government, church, NGOs) could take them over and operate them. Following the voluntary retirement program carried out by GÉCAMINES in 2003-2004, more than 10,000 employees were at risk of losing their access to schools and medical facilities. In order to relieve distress on the families and in view of the delays in transferring these social assets to a new party, funding was accessed by GÉCAMINES through the World Bank to supplement the salaries of the teachers and medical personnel.

A second issue is that most of the private partnership agreements signed between the state-owned enterprise and private partner specifically state that the private party is not responsible for assuming any of the costs for provision of social services. It maybe possible, however, to reach an agreement with the companies to continue to supply services such as electricity and water to the local communities, insofar as these are necessary for continued minerals production. Also, it is noted that several NGOs are working with private companies (some in partnership with SOEs) to continue social service provision. Finally, some private companies

have decided to maintain the social services, at least for employees, as a means of ensuring a supply of trained manpower.

A third issue has been the impact on communities of the arrearages in payment of salaries, as well as the loss of income for retrenched employees.[53] Downsizing of the work force is a difficult undertaking in every industry in any country, even under optimal conditions. In spite of indemnity payments made to the retirees of GÉCAMINES, for instance, loss of job security and a source of income (even though salaries in many instances had not been paid in months) have caused considerable distress to employees, especially since the DRC has no formal safety net system. It has also caused distress to local and provincial suppliers of tradable and non-tradable goods and services, whose businesses and incomes depend on the expenditures of the GÉCAMINES employees. Also at issue is the need to find suitable livelihood possibilities for employees who have lost their jobs. The success of the *program de reinsertion* which accompanied GÉCAMINES' voluntary retirement program has had only modest success, partly because it did not become effective until after the employees left the company; and partly because the types of skills and training offered to the retirees were not well adapted to the realities of the local conditions and to their age and work experience.[54]

Company Relations with the Community

Consultation. The Mine Law of 2002 and accompanying regulations establish procedures for community consultation prior to issuance of the mining permit. International best practice is for extensive and meaningful prior informed consultation to take place with the local community from the beginning of the exploration work. During consideration relative to issuance of an exploitation permit these consultations generally take place within the framework of discussions on the environmental impact assessment and the company's environmental management plan. However, very little meaningful consultation with communities appears to take place in DRC. Some of the larger (foreign) investors do make attempts at dialogue with local communities, but these discussions are oftentimes slanted toward finding ways to encourage artisanal miners to leave the company's concession area. Smaller and medium-size companies do not appear to conduct a dialogue with the local community at all, relying instead on contacts with the local village chief or other political operative. Environmental impact assessments and management plans may be discussed with

[53] The manner in which the "voluntary retirement" program has been carried out by GÉCAMINES has been criticized by the retired employees as well as certain outside observers. In March 2007, the retirees petitioned the Government for additional payments, claiming that the original indemnity payments received were neither calculated correctly nor explained to them properly at the time. This criticism, while understandable, is not entirely justified. While it is true that in some cases the indemnity payments did not reflect the full amounts which should have been received by the employee by virtue of grade, length of service, or the terms of employment, each retiree signed a release prior to receiving the funds. The average payment for GÉCAMINES employees was US$10,175 per person. There are clearly equity issues involved in the use of public funds for the purpose of indemnifying retrenched employees in an economy where the average per capita income is US$ 132 per year.

[54] The difficulties with the *program de reinsertion* in DRC have also been encountered in other countries. In Ukraine and Poland, for instance, the programs to retrain retrenched coal miners succeeded with only a fraction of the employees. In the United Kingdom during the late 1980s and early 1990s, the downsizing of British coal involved the retrenchment of nearly 500,000 coal miners. In addition to handsome indemnity payments, the miners were offered training in new skills and packages to start up new businesses. Only relatively few of the miners actually succeeded in new jobs or businesses; this was attributed to the mid-level age profile of the miners, their work experience and skills set, their reluctance to move away from the company towns where they had family and friends, and the generous safety net provisions in the United Kingdom.

the local government authorities (if they are discussed at all), but this is rarely more than a cursory discussion and does not appear to involve meaningful dialogue with the local community.

However, improvements in the consultation process are underway. Several companies have engaged NGOs, with supplemental funding from USAID, DFID, and other donors, to improve general corporate governance and the consultation process. International best practice recognizes consultation as a continuous process, not simply something to be carried out before the mining permit is issued. The consultation is to be conducted periodically, according to set procedures and mechanisms, with full disclosure of relevant information in a form comprehensible to the community members. The Ministry of Mines should develop specific regulations for consultations with the local communities and require compliance with these a prerequisite to issuance of mineral rights. In some countries, benefits and investment agreements are negotiated between the company and the local community which define the rights and obligations of both parties during the project lifecycle.

Mechanisms also need to be established for the distribution and management of benefit streams to the local community, possibly through a community development fund, which would be established by the company and managed jointly by committee members selected by the local committees, and including representation of local governmental authorities. A danger is that the company would deal only with the local community hierarchy or senior provincial official, and that little funding would actually reach the community level. This has occurred in the past in DRC.

Security and armed forces. There are also special considerations concerning the use of, or support to, national or local armed forces. Companies face the dilemma of protecting their workers and property while, at the same time, not becoming (or be accused of becoming) involved in violent actions by armed groups. Most large international companies have in recent years adopted corporate-wide policies in this respect, but the political realities of DRC may render effective application in the field problematic. For instance, Anvil Mining, which operates the Dikulushi deposit in Katanga, had an unfortunate incident when it was obliged to provide transportation to a detachment of the National Army, which ended in significant bloodshed and the death of several members of the community. Anglo-American Ashanti gold mining company has also been accused of supporting armed militia groups near its concession areas in Ituri.

Economic impacts. Mining operations have significant and direct impacts on local communities, both positive and negative. While these impacts are in the main positive, they are sometimes a mixed blessing. The Mine Law requires a retrocession to the province of 25 percent, and to the local community 15 percent, of mining royalties. According to the medium growth scenario discussed in previous chapters, a new industrial gold mine in Ituri province would produce approximately US$4 million in royalties per annum, of which US$1 million would revert to the provincial authorities and US$600,000 to the local community. Injections of cash in these amounts not only poses significant management problems for the administrations concerned, but also may not be absorbed effectively by the province or local community. The mines also inject large amounts of funds into the community in terms of payroll, purchases of local goods and services, and payment of local fees and taxes. On the basis of information in feasibility studies, the Tenke Fungurume mine will generate US$1.2

million per year for local development funds beginning in 2007 and more than US$10 million in taxes and duties between 2007 and 2009.[55]

These beneficial impacts have their drawbacks. In certain districts, such as Kolwezi, the boom in mining has caused significant shortages of housing and facilities for workers and their families. Logistical support for the industry in terms of supply of goods and services is also strained. Essential infrastructure such as schools, hospitals, and water and electricity supply are overburdened. Importantly, since the mines pay higher wages than other sectors and, in any event, cannot employ everyone, there is a tendency to develop "have and have-not" segments of society. Those without mine employment are often disadvantaged, since the shortages of goods and services noted above generally results in increased prices of essentials, which hit the have-nots especially hard. Established hierarchies of social organization in the communities are sometimes disrupted by the presence of the new mine and the influx of newcomers. More commonly, the established hierarchies simply appropriate for themselves the funds and cash generated by the mine, leaving little or nothing for the local population. Finally, little planning appears to take place regarding the impacts on the community of mine closure. International best practice requires that companies, government, and communities should begin planning for mine closure when the mine opens. The Mine Law and regulations, however, simply make provision for funds to be put into an account for site rehabilitation, and do not specifically address the social and community issues involved in mine closure.

Environmental Liabilities

Environmental impacts of mining operations in DRC are substantial and growing worse. The general impacts of mining activities on the environment – water, soil, and air pollution – are well documented. The Government has yet to develop environmental legislation in general or for the mining sector in particular, apart from the occupational health and safety legislation inherited from prior years. Even if such environmental legislation existed, the government services responsible for mines inspection, as noted earlier, would have little or no capacity to enforce the legislation. In Katanga, mining is taking place (and has taken place over many years) without regard to effective environmental protection. Mine tailings and waste dumps are decaying and may suffer catastrophic failure, posing significant pollution dangers to water courses and agricultural soils. Acid mine drainage in many areas is polluting water supplies. Improper closure of pits and mines poses a danger to humans and animals. Heavy trucks hauling equipment, supplies, and mineral product frequently pass through villages at speeds that put inhabitants at risk. The many small-scale furnaces and processing plants that have been established in Katanga over the past several years to process the ores sold to them by artisans operate with few or no environmental protection measures. One such plant – operated by Chemaf – is allegedly dumping toxic effluent into the upstream catchment area for the water supply of Lubumbashi.

Legacy Issues, Pollution Stocks, and Pollution Flows. Mining has taken place in many areas of DRC since the early 1900s. Over the years, significant stocks of pollution have accumulated, and old mine workings have not been properly closed or rehabilitated. This is a task which many countries face, but it will be particularly difficult and expensive for DRC, given the extensive nature of the problem. The Government will need to prepare a comprehensive inventory of the legacy sites and a national environmental remediation plan for the pollution stocks. Importantly, the partnership agreements signed between the state-

[55] These are estimates from the feasibility study. The actual contributions for 2007 are not known.

owned enterprises and private partners generally explicitly waive any responsibility for existing environmental liabilities by the private partner or the new entity which is created to operate the mine. The contracts state, in many cases, that the liabilities remain the responsibility of GÉCAMINES and/or the government. However, no audits have been conducted of the mines to distinguish the existing pollution stocks from probable future pollution flows. Under the principle of "polluter pays," the new company should be responsible for management and eventual remediation of these flows. Furthermore, the Mine Law specifies that all mineral rights holders need to establish an environmental rehabilitation guarantee in favor of the government. International practice is generally for the mineral rights holder to arrange for the posting of a bond or guarantee through a reputable financial institution, and the establishment of a special reserve account within the financial statements of the company to cover the eventual costs of rehabilitation. In practice, since there are no international or local banks in Congo willing to issue these guarantees, the company must pay substantial sums up-front as rehabilitation guarantees upon issuance or renewal of the mineral right. As has been noted, no evidence can be found of effective government agency control of the rehabilitation funds that the companies have paid; the funds that have been paid are unaccounted for.

6. Comprehensive Plan to Achieve Growth with Governance in the DRC Mining Sector

This report concludes that the mining sector in Democratic Republic of Congo will not contribute to sustainable growth with governance unless and until certain critical deficiencies are addressed. For the past several years, the Government and multilateral and bilateral donors have undertaken a piecemeal approach to addressing selected issues. A comprehensive plan and approach, with precise goals, performance indicators, and sufficient financial and technical assistance is required. The report proposes a comprehensive action plan for the next five years to improve the performance of the mining sector. The action plan includes a number of measures to be undertaken over the short, medium and longer terms. While these actions are to be undertaken primarily by the Government, progress toward sustainable growth will require the active involvement of private sector companies, civil society organizations, and the international donor community. In addition to the measures enumerated in the action plan, issues related to security in several of the mining areas are clearly a priority for the Government as well as UN security forces.

Table 9. Summary of Action Plan

Objective	Timeframe	Estimated Cost US$ million
Increase fiscal receipts	Next 12 months	11
Improve enabling environment for new investment	6 - 24 months	1.0
Improve governance and transparency in the sector	3 - 48 months	27.5
Strengthen government capacity	3 - 60 months	147.5
Maximize contribution of mineral assets	6 – 24 months	145.5
Improve conditions of artisanal and small-scale mining	3 - 60 months	44.0

Increase fiscal receipts

Objective: To increase the central government's capacity to properly assess, collect, record, and report taxes and other fiscal levies from the mining sector

Output/Results: Increase fiscal receipts effectively received by the central government to US$80 million by end 2008.

Timeframe: Next 12 months

Actions/Activities:

1. *Government should commission independent audits by internationally recognized firms of the financial accounts of key mineral producers and trading houses.* The audits should be conducted in two phases. The first would verify conformance with applicable legislation with respect to royalty payments, surface rents for mineral rights, and other administrative charges. The second phase would verify compliance with applicable legislation with respect to payment of income-related taxes and

import/export duties and customs. For both phases, the auditors would conduct sufficient tests and examinations in accordance with recognized accounting and industry standards. Where data are insufficient to permit conclusions (as, for instance, assay data on exported products, price references, and sales receipts to determine royalty payments or depreciation; and operating cost data to determine imposable income) ,the auditors would recommend remedial measures.

2. *Government should commission an independent risk control and assessment review of the structure, operational processes and practices, reconciliation procedures, staffing levels, and competencies of the government agencies*[56] *responsible for assessment, collection, and recording of fiscal payments.* Particular attention should be directed to determining where and how leakages occur between the payments made by companies with respect of tax and royalty obligations and the amounts duly reported and recorded in the accounts of the central treasury.
3. *Collection and reporting functions pertaining to the mining sector currently domiciled within DGRAD should be merged with, and integrated into, the functions of DGI.* DGRAD is not effective in collecting and reporting on mining royalties, surface rents, and other administrative fees pertaining to the mining sector. The collection and reporting of mining sector taxes currently handled by DGRAD (essentially surface rents and mining royalties) should be transferred to DGI, which is responsible for other mining-related taxes. Administration and assessment of these taxes and fees would remain within appropriate agencies of the Ministry of Mines.
4. *A specialized cell should be established within the large taxpayer office (LTO) of the DGI* to monitor, record, and ensure the traceability of all fiscal receipts from the mining sector. This unit would focus not only on the large mining companies but also on other commercial entities operating in the sector, such as trading houses, processing companies, and comptoirs. To improve the traceability of tax receipts from the mining sector the government has authorized by decree of the Prime Minister the establishment of a "compte transitoire" through which these receipts can be segregated and traced.
5. *An international firm should be contracted* for a period of 3 – 5 years to establish the guidelines and procedures for the mining specialization within the LTO, train staff, and develop the necessary computer systems and software. The firm would oversee the operations of the mining specialization within the LTO. All such payments from the mining sector would be regularly and completely disclosed publicly.
6. Additionally, the *fiscal receipts of the sector collected by the LTO should be audited on a regular basis* by qualified independent auditors, and the audit reports made public.
7. Government should adopt *clear rules, guidelines, and procedures* for retrocession of mining revenues to provinces, and for accountability for those revenues by the provinces.

Improve the Enabling Environment for New Investment

Objective: The DRC Mine Law of 2002 and the fiscal regime for mining investment are competitive with international standards. However, certain improvements are needed in the law and fiscal regime to address specific deficiencies.

[56] OFIDA, DGRAD, DGI, BCC, Ministry of Mines, CPCTM, SAESSCAM, CEEC, CAMI, authorized tax collection centers.

Output/Results: Specific regulations adopted under ministerial or presidential authority.

Timeframe: Next 6 – 24 months.

Actions/Activities:

1. *Adopt specific regulations in support of the Mine Law of 2002* relative to improving (a) security of tenure for artisanal miners; (b) procedures and guidelines for environmental protection and community consultation; (c) requirements for disclosure by companies and government officials, and sanctions and penalties to encourage compliance; (d) compatibility of the Mine Law with other legislation; (e) regulations with respect to processing and beneficiation facilities; and (f) procedures for granting and surveillance of mineral rights.

2. *Adjust or introduce certain fiscal dispositions*: (a) introduce a sliding scale royalty to capture a greater share of rents resulting from increases in commodity prices; (b) establish a fee assessed on the basis of value added or capital gains, to be collected at time of transfer of the mining title; and (c) promulgate regulations requiring all companies to adopt international accounting and reporting standards.

Improve Sector Governance

Objectives: To ensure that (i) the sector grows responsibly and in a sustainable manner; (ii) interactions between government, private sector companies, artisans, and communities take place in a completely transparent manner; (iii) existing and future partnership contracts are concluded in a transparent manner, in accordance with the Mine Law of 2002, and that terms and conditions of contracts as well as material facts concerning the companies are fully disclosed; (iv) transactions and financial accounts of companies and government, and fiduciary or other management interests of government officials in mining companies or vendors/suppliers thereto, are fully disclosed and potential conflicts of interest are eliminated; and (v) distribution of benefits streams is fair, in accordance with generally accepted principles in the international mining industry.

Outputs/Results: Adjustments to certain partnership contracts, enhanced benefits for the State and communities, improved security of tenure for companies, and improved transparency and access to information.

Timeframe: Ongoing and through the next 48 months.

Actions/Activities:

1. *Adjust, through consultation with the contracting parties, certain partnership agreements.* The inter-ministerial commission created to re-read 60-63 partnership contracts should do so expeditiously, thoroughly, transparently, and with the highest standards of professional competence. The commission should recommend to the Ministry of Mines and, through it, to the Council of Ministers, what adjustments to the contracts, if any, should be considered. The Council of Ministers should invite the contracting parties to discuss and come to an agreement concerning these adjustments. Many adjustments will be on technical issues which are not sufficiently clear in the contracts, such as, for example, clarification of exact legal status of the

contracting entities; validity of mineral rights; internal joint venture operating agreements and accounting standards; clauses for protection of minority rights; more effective voice of State partner company in the management of the joint venture; and enhanced clarity with respect to financial controls and reporting within the joint venture. Other more extensive adjustments may be required to the extent that (a) the contracts do not conform to Mine Law of 2002, provide for excessively lenient tax conditions, and/or are fundamentally unfair in comparison with international best practice; and (b) the contracting parties are not respecting the mutual obligations of the contract. The Commission should disclose the criteria against which the contracts have been reviewed, as well as the procedures for conducting the reviews.

2. *Improve supervision of the partnership contracts,* using expert legal and financial consultants. The appointment of independent legal advisors to GÉCAMINES is an important step in this direction. The Government may wish to consider making available similar expert legal advice to other parastatals.
3. *Ensure better due process for all future contracts* between the State, state-owned entities, and private partners. In particular, the Government should ensure that (a) the processes involved in the contract negotiations, as well as the eventual encumbrance of mineral rights, conform to the Mine Law of 2002; (b) the assets involved in the contract have been properly evaluated; (c) the terms and conditions of the contract provide for an equitable balance for all parties to the contract, taking into account the financial and technical risks; (d) professional legal counsel is available to assist in negotiation of contracts; and (e) the contracts are duly authorized for signature following the appropriate legislation. Further, in order to ensure the best possible outcome, the Government may wish to consider appointment of an independent panel of outside qualified experts to review the contracts in terms of the processes followed and the fundamental fairness of the deal.
4. *Disclose and publish all past and future contracts,* by common accord with the contracting parties. In fact, the government has published many of the mining and other contracts on the Ministry of Finance website: http://www.minfinrdc.cd/contrats_partenariat.htm. The government should continue the process of publishing in their entirety all contracts as well as any subsidiary – with appropriate protection of proprietary information (technical processes, commercial contracts, and personnel data). Furthermore, as publication of the contracts alone may not give a complete picture of the parties involved in the negotiations or the chain of custody of the mining rights in question, it is recommended that the Government require the private company cause to be prepared by independent counsel or competent person a disclosure of all material terms and conditions following the rules of a major equities exchange, such as the Toronto (www.tsx.com) or Australian Stock Exchanges. (Some companies, to the extent they are publicly listed, will have already done so; this information is available on the website: www.sedar.com).)
5. *Improve disclosure of revenue flows from the mining sector,* notably through diligent implementation the Extractive Industries Transparency Initiative. The first report on reconciliation of taxes paid by mining companies, with taxes effectively received by the central treasury, should take place by December 2008. The publication should list, at a minimum, each material tax, payment, royalty, levy, or other fiscal impost made by the mining sector and effectively received by the central government treasury. In addition, the Government should adopt specific regulations to provide for disclosure by companies of all payments made on a regular and consistent basis. For this purpose, the Government should build upon the recommendations of the EITI as

well as recruit specialist advisors. Finally, the Government should implement the recommendations of the risk control and assessment audits of government agencies, in particular to ensure tracing of surface rents, royalties, and other tax payments made by the companies to various government departments.

6. *Improve tracking and tracing of mineral commodity flows*, through continued research on various "traceability, certification, free trade" systems currently under development. The science must be perfected and the costs/benefits accurately estimated before any final decision can be made relative to implementing such systems.
7. *Competitive award of mineral properties,* as provided for in the Mine Law. The tender procedures would be applied for mineral occurrences for which the Government and/or state-owned mining enterprise has sufficient geological information to attract qualified bidders. The Ministry of Mines should publish a list of the mineral deposits which may be subject to tender. Additionally, in the event that an exploration license or partnership agreement is canceled by the Government for non-compliance with the work program or other contractual obligations, tender procedures should be applied to attract new companies – provided that there is sufficient geological information to justify the tender.
8. *Elimination of actual or potential conflicts of interest of government officials.* To this end, the Government should adopt regulations to (a) prohibit government officials from serving on boards of directors of companies, except in their official capacity as representatives of the Government's participation; and (b) require full disclosure by government officials of any and all financial interests, stockholdings, or relationships with vendors/suppliers in or to mining companies.

Strengthen Government Institutions and Build Capacity

Objective: Improve the ability of the Government to effectively and efficiently supervise, monitor, and evaluate activities in the mining sector, as well as to deliver technical and professional assistance to artisanal miners. For the purpose of quickly and effectively reinforcing government institutions and to build capacity, the Government may wish to recruit specialized and experienced consulting firms.

Outputs/Results: Improvements in information to government on minerals production and activities; reduced speculation and enhanced compliance with work program requirements; improved health, occupational safety, and environmental conditions at mine sites; improved declaration of mineral export volume and values; better capacity for financial and economic analysis of projects; improved understanding and knowledge of geological potential and possible land use.

Timeframe: Over the next 60 months.

Actions/Activities:

1. *Improve efficiencies in mineral rights issuance and management.* The Mining Cadastre Service (CAMI) should:
    - Develop more precise criteria and guidelines for the time it takes to process requests for mineral rights, and update its software and hardware as necessary to enable rapid processing of applications.

- Develop control and monitoring of activities on the ground. In effect, many mineral rights holders simply hold to the concession without doing any serious work in terms of exploration or exploitation. CAMI and other government services do not have the logistical means or manpower to effectively monitor and evaluate what is happening on the ground.
- Reinforce links with other key government agencies, especially with the Ministry of Finance and Central Bank, with a view to closing the gaps between the amounts assessed and collected, through a better system to trace payments directly to the mining title registration number. This could be done with addition of bar code technologies to the permit documentation. In addition, CAMI could be authorized to directly collect these surface rents, and be held accountable for their tracking and timely transfer to the Central Bank.
- Open antenna offices in key mining areas such as Katanga, the two Kasais, Orientale Province, the two Kivus, Bas-Congo, Maniema, and Bandundu. The antenna offices would be minimally staffed and equipped, and linked by existing telecommunications infrastructure to CAMI's main processing center in Kinshasa.

2. *Reinforce the central and provincial offices of the Ministry of Mines* and its various administrative units, attached services, and the various commissions (such as the Kimberley Process) under the Ministry's control.
3. *Deliver effective assistance to artisanal and small-scale miners.* SAESSCAM is the government agency designated to provide support to small-scale and artisanal miners and to help in the formation of cooperatives. Also, SAESSCAM would be a key link in any traceability system that may be put in place. SAESSCAM should:
    - Develop a program to train SAESSCAM staff in the technical specifics of small-scale and artisanal mining;
    - Execute a program to disseminate the Mine Law and its regulations, since the artisans do not know or understand their rights and obligations under the law;
    - Actively assist artisanal miners to establish themselves in special zones reserved for artisanal mining activities;
    - Extend activities to other key mining centers, reducing its "head-office" expenses in favor of those directly on the ground. It is especially important that SAESSCAM officials assist artisanal miners in isolated areas.
    - Work with industrial mining companies, NGOs and community-based organizations to develop alternative livelihoods programs for artisanal miners.
4. *Improve monitoring of health, safety, and environmental conditions at mine sites.* A mines inspection service should be created and trained, in the first instance, in Katanga province; this agency will be responsible for surveillance and inspection of compliance with relevant health, occupational safety, labor, environment regulations. The service would liaise and cooperate closely with local populations and provide linkage to the provincial administration of mines. It is recommended that the Government contract with a specialized international firm or donor agency for a period of 3 to 5 years. The firm/agency would quickly and effectively build and train a cadre of local specialists; develop procedures, practices, and operational manuals for the service; and provide logistical and materiel support.
5. *Improve control and valuation of diamonds.* In the particular, the CEEC (diamond expertise and evaluation office):

- Should be audited by an outside internationally recognized audit firm across two dimensions: (a) a financial audit would report on the conformity of the financial accounts of CEEC to national and international standards; and (b) a technical and operational audit would report on the performance of the CEEC in valuation and assessment of diamonds.
- Consider appointment of an independent diamond auditing office to valuate selected parcels of diamonds to confirm CEEC's valuations.

6. *Improve financial and economic evaluations of proposed projects.* The CTCPM (Cellule Technique de Planification Minière) is currently charged with this function. A program should be developed to create and train a specialized unit for financial analysis and evaluation of feasibility studies and financial statements of mining companies.
7. *Improve border controls to reliably report the quantity and quality of mineral exports.* The Government should license several independent and internationally recognized laboratories to assay, test, and control mineral commodities at points of export, in the first instance in Katanga province. The labs would establish testing procedures to accurately determine the volume and payable mineral content of the exports; as well as provide the company and Government with documentation and manifests to permit tracking and calculation of the royalty. Any contracts which the Government may have with laboratories at present, particularly with respect to fees paid to the laboratories, should be reviewed. Under no circumstance, should the fees be based on a portion of royalties that would otherwise be paid to the State. Instead, the laboratory should be paid on a standard contract basis.
8. *Improve the state of geological information and data.* With the Ministry of Scientific Research, which is in charge of geological mapping and earth sciences,
    - Upgrade geological mapping and earth science data base through a major program on regional mapping and cartography;
    - Install a functional GIS system that integrates various geological datasets;
    - Repatriate to DRC information and data in digital format at the Royal Museum of Tervuren in Belgium;
    - Rehabilitate various university programs and research centers.

Maximize the Contribution of DRC's Mineral Assets and Endowment

Objective: Ensure that the mineral and productive assets of state-owned companies and private enterprises contribute optimally to overall economic development of the nation, provinces, and communities where the mining operations take place.

Output/Results: Reform and restructuring of state-owned enterprises; entry of private owners and managers in all SOEs by 2009; elimination of many administrative restrictions and hassles constraining the operations of private companies; significant improvements in transportation infrastructure in the key mineral producing zones.

Timeframe: Next 36 months.

Actions/Activities:

1. *Adopt legislation to provide the basis for reform and restructuring* of the state-owned mining enterprises and, in particular, the possible entry of private owners and

managers. Laws to this effect are currently under consideration and should be passed by the National Assembly.

2. *Recruit through international competitive processes private investors and managers* for the SOEs. An initial step in this direction could be to recruit a firm to manage each enterprise, mobilize the required capital for investment, and set remuneration as a portion of the profits and/or production.
3. *Disengage the State from majority ownership and management of SOEs.* The legislation under consideration provides for the State to divest all or a portion of its ownership in SOEs. The Government should contract with internationally experienced transaction managers to conduct detailed studies on how best to accomplish this objective.
4. *Launch a public offering for one or more SOEs.* One option to seriously consider is to offer shares of a restructured SOE in an international equities market (London or Toronto). For instance, with the assistance of qualified investment professionals and transactions managers, it could be possible to conduct an initial public offering for GÉCAMINES. This has been done successfully for state-owned mining enterprises in other countries.
5. *Reduce administrative constraints and hassle factor* for private sector companies. To accomplish this, the Government should commission a detailed study of various barriers to entry and constraints faced by private sector mining companies. Based on the results of this study, the Government should adopt a vigorous program to eliminate the constraints, possibly through establishment of a one-stop shop for potential mining investors.
6. *Improve road, rail, and power infrastructure in key mining areas.* The ultimate goal is to reduce cost and improve reliability of essential infrastructure in key mineral producing areas. To achieve this goal, the Government should restructure SOEs involved with infrastructure; develop appropriate regulatory frameworks; and rehabilitate and/or construct new road, rail, and power infrastructure. This will require substantial support from the international donor community over the next five years. In this respect, it is important to coordinate with other donor initiatives and, in particular, the recently announced Chinese loan to the Government for infrastructure.

Improve Conditions for Artisanal and Small-scale Mining

Objective

Improve the productivity, security, safety, and working conditions of artisanal and small-scale miners through enforcement of applicable legislation (including prohibition of child labor); promotion of alternative livelihoods; and creation of conditions that are socially and environmentally sustainable.

Output/Results: Reduced conflict and tensions between artisanal and industrial miners; creation of artisanal mining zones and artisanal miners' cooperatives; improved safety and health inspections of artisanal mining sites; increased productivity and recovery for artisanal miners; and creation of alternative livelihoods and employment possibilities for artisanal miners.

Timeframe: Over the next 60 months.

Actions/Activities:

1. *Improve security of tenure for artisanal miners* in order to reduce conflicts with industrial operators. This can be accomplished through the designation of special zones for artisanal miners, as provided for in Article 109 of the Mine Law of 2002. These zones should be mineral prospective and in reasonable proximity to transportation infrastructure, river courses, and other support infrastructure such as housing, sanitation, and water. The minimum size of the zone should be at least 5 *carrés*, (the standard unit of measurement in the mining cadastre) or the same minimum size as a quarry exploitation permit.
2. *Adopt regulations and criteria for small-scale mining.* Certain deposits are too small for large-scale industrial mining but too large for efficient working by artisanal miners. The Mine Law does provide for small-scale mining permits, but the criteria to be applied to this type of permit need to be better defined. The Government should engage competent legal and technical advice to prepare these criteria and regulations.
3. *Recognize artisanal miners' cooperatives,* which could then obtain a small-scale mining permit. The Congolese Civil and Commercial Code will require amendment to provide for legal personality for such cooperatives.
4. *Improve enforcement of labor, health, safety, and environmental standards* through the specialized mines inspections units to be established within the provincial mine offices. For this purpose, the Government may wish to consider recruitment of specialized companies; and/or to set up a special office to track the transport and commercialization of mineral products produced by artisans. This would most likely be part of a traceability scheme currently being studied by several donors.
5. *Improve productivity and recovery factors of artisanal miners* through extension services by SAESSCAM and other government agencies/NGOs. These services would provide technical assistance, equipment, and funding to upgrade extraction techniques and improve safety standards. Additionally, a program should be established to sensitize artisanal miners about international market conditions for their products, and help ensure that they receive fair market value for their production. In this respect, it will be necessary to work closely with trading houses and other intermediaries that purchase the output of artisanal miners.
6. *Improve beneficiation of minerals by artisanal miners* and various intermediaries. This could be accomplished through establishment of a pilot beneficiation and value-added facility in key mineral producing provinces. This facility, if successful, could be replicated by private investors in other production areas. In tandem with this program, the Government should enforce the prohibition on exporting all minerals in raw ("brute") form, starting with the province of Katanga. The measure would have the advantage, among others, of slowing down illegal exports, as well as encouraging transformation and beneficiation of the raw ores, which would increase the value added to the artisans. The Government may wish to facilitate the establishment of cutting and polishing centers for diamonds and precious stones and provide funding for training programs. However, careful consideration should be given to the costs and benefits of this approach, given the dominant position in the market already played by cutters and polishers in other countries.
7. *Develop alternative livelihood programs* with the assistance of bilateral donors, industrial companies, community-based organizations, and NGOs. The objective would be to absorb some of the artisanal workforce into other occupations. In particular, partnerships could be formed with industrial enterprises to target certain key services which these companies require. A program could be developed to train and establish artisans to service the requirement.

Address Environmental and Social Issues

Objective: Improve the mining sector's conformance with internationally recognized norms for environmental and social protection.

Output/Results: An inventory and risk assessment of environmental problems in key mineral producing areas; attenuation and/or remedy of those classified as the most pressing; improved capacity to review impact assessments and management plans presented by companies, as well as surveillance of compliance therewith; and improved relations between the community and various industrial enterprises.

Timeframe: Next 60 months.

Actions/Activities:

1. *Inventory and risk assessment of pressing environmental problems* in key mineral producing areas. The inventory would identify legacy problems and propose measures to remediate them.
2. *Conduct baseline environmental studies for partnership contracts,* in order to distinguish pollution stocks from future pollution flows. This will enable the Government and the private partners to assume proportionate responsibilities for environmental matters.
3. *Adopt appropriate and internationally competitive regulations* with respect to environmental protection and responsibilities of Government and private sector companies.
4. *Improve the capacity of Government institutions* to evaluate environmental impact assessments and management plans and enforce compliance.
5. *Develop a program to work with artisanal miners on environmental awareness matters,* including sensitization on health and safety measures.
6. *Ensure that rehabilitation financial guarantees are effectively reported and used for purposes required.* The Government may wish to consider dispensing with the requirement for upfront payments in return for other performance guarantees and bonds.
7. *Promote more effective community consultation* by reinforcing the dispositions in the Mine Law and/or adopting additional regulations. It is also necessary to enforce the existing and future requirements for community consultation by linking reports on effective consultation to issuance of the mineral title.
8. *Provide for continuation of social services provided by SOEs,* possibly through spin-offs of social assets of the SOEs to appropriate entities, or through other cooperative ventures.

Table 10. Increase Fiscal Receipts

Objective	Goals	Output/Results	Activities	Interested parties and nature of assistance	Priority	Cost (US$ M)
Increase fiscal receipts	Improve assessment and collections	US$80 million in fiscal receipts by end 2008	Audit of companies	MOF, MOM, IMF, WBG, Int'l consultancy	high	3.25
			Audit of government processes	MOF, MOM, IMF, WBG, Int'l consultancy	high	1.0
			Combine functions of DGRAD with DGI	MOF, MOM, IMF, WBG, Technical assistance and logistical support	high	0.5
			Establish special cell within large taxpayers unit (LTU)	MOF, MOM, IMF, WBG, Technical assistance and logistical support	high	0.5
			Outsource management of special cell	MOF, MOM, IMF, WBG, International consultancy	high	3.0
			Independent audit of tax receipts	MOF, MOM, IMF, WBG, Int'l consultancy	medium	1.0
	Address special fiscal issues		Adopt rules and guidelines for retrocession of mining revenues from central to provincial governments	Central and provincial governments, parliament, advisors	high	0.5
			Adopt requirements that all mine companies use international reporting standards	MOF, MOM, IMF, WBG, special cell in LTU	medium	0.25

Table 11. Improve Enabling Environment for Investment

Objective	Goals	Output/Results	Activities	Interested parties and nature of assistance	Priority	Cost (US$ M)
Improve enabling environment for new investment	Strengthen mining law and regulations		Adopt specific mining regulations relative to artisanal miners rights, strengthened environmental protection, community consultation, and disclosure	MOM, WBG, Local and international legal advisors	medium	0.5
	Strengthen fiscal regime		Amend fiscal dispositions for sliding scale royalty and fee on mine right transfer	MOM/MOF/WBG, Local and international fiscal advisors	medium	0.5

Table 12. Improve Sector Governance

Objective	Goals	Output/Results	Activities	Interested parties and nature of assistance	Priority	Cost (US$ M)
Improve Sector Governance	Adjustments to certain existing partnership contracts	Enhanced benefits for the State; improved security of tenure for investor; and improved internal management of contracts	Re-Read 60+ partnership contracts; Government commission should conclude work expeditiously, in a thorough and transparent manner, and with the highest standards of professional competence	GDRC, Inter-ministerial commission	high	0.5
			In consultation with partners, adjust terms and conditions of certain contracts	GDRC, MOM, Int'l and Nat'l legal advisors	High	1.5
	Improve supervision of partnership contracts	Better compliance of partners with contractual obligations	Engagement of qualified legal assistance for Gecamines	Belgian law firm has been recruited	high	0.75
			Additional legal and financial/economic reviews of contracts by qualified experts	Local and international law firms	high	1.5
	Ensure due process for all future contracts and "fairer" contracts	Better terms and conditions of contracts; transparent processes for award observed	Recruit qualified local and international legal, financial and economic expertise for negotiations of future contracts	Ministry of Mines, local and international legal experts	Medium	2.5
			Proper and professional valuation of assets	MOM/SOEs, int'l and local consultants	High	3.0
			Submit contracts for "fairness" review by independent advisory panel	International advisors and experts	Medium	1.25
	Disclosure of contract terms and conditions	Better transparency and public awareness of contracts	Publish all contracts and/or certified syntheses of the material terms and conditions of the contracts, chain of custody of the mineral right	MOM, SOEs	High	0.5
	Improve disclosure of	Publication of synthesis reports by companies	Adopt legislation modeled on Toronto Stock Exchange to require	MOM, International legal experts and	High	0.5

	information on partners and companies	relative to corporate organization	disclosure of material information and facts on company organization, share ownership, directors and management, internal decision making, chain of custody of permits, material terms and conditions of contracts	consultants		
	Improved disclosure of revenues flows from the sector	Published information according to template of all fiscal and other receipts paid by companies and received by the government	Rapid and effective implementation of the EITI	MOF, MOM, Implementation committee of EITI; international advisors	High	3.0
		Companies to publish payments made on regular basis	Adopt specific legislation requiring companies to disclose payments to government	MOF and legal advisors to government	Medium	0.5
		Plug loopholes which allow leakages of tax revenues in government accounts	Implement recommendations of risk control and assurance audit of government processes	MOF and consultants and government	Medium	0.5
	Improved tracking of mineral commodities	Eliminate trafficking of minerals for arms and clandestine exports	Continue scientific investigations and conduct economic cost-benefit analyses of various "traceability" schemes currently under development.	MOM, international donors (particularly the Belgians and Germans)	Medium	10.0
	Competitive award of mineral properties		Implement tender procedures for certain mineral properties as provided for in the mine law	MOM/ SOEs, local and international consultants to organize tenders	Medium	1.0
	Elimination of potential conflicts of interest		Adoption of specific legislation to prohibit government officials to serve on boards or as officers of mining companies	GDRC, Local legal expertise	Medium	0.25
			Require disclosure by government	GDRC, Local legal	Medium	0.25

			officials of any and all fiduciary interests in mining companies	expertise		
			Enforcement of existing dispositions relative to government officials holding directly or indirectly mining rights	GDRC, Local legal expertise	High	N.A.

Table 13. Strengthen Government Institutions and Build Capacity

Objective	Goals	Output/Results	Activities	Interested parties and nature of assistance	Priority	Cost (US$ M)
Strengthen government institutions and capacity to monitor and supervise sector developments	Improve efficiencies in mineral rights management	Reduced speculation, improved processing times, better compliance with work program obligations	Mining cadastre (CAMI) should deploy offices to provinces, establish criteria for processing times, update software, monitor activities on the ground, adopt tracking mechanisms, improve links to other government services	MOM, CAMI, local and international technical assistance and consultancy firm	High	13.5
	Improve overall government oversight of mining sector	Improved compliance with work program obligations, coherent management of sector;	Reinforce Ministry of Mines at the central government and provincial levels	MOM, technical assistance from local and international experts, logistical and materiel support	High	6.0
	Deliver effective government assistance to artisanal miners	Improved production efficiencies and mineral recoveries; improved health, safety and environmental conditions; reduction in fraudulent activities	Strengthen SAESSCAM by training personnel, dissemination of mineral law information, assist artisans to organize, provide technical extension services, linkage to tracing systems, extend services into more artisanal mining areas	MOM, provincial governments, local and international technical assistance	Medium	12.0
	Improve monitoring of health, safety, environment conditions at mine sites	Site inspections of at least 20 exploitation operations per year in Katanga province;	Rejuvenate the mines inspection functions (starting in Katanga province); outsource inspections as a means to quickly build cadre of trained staff.	MOM, outsource of inspections function and training of local staff; supply of logistical and materiel support	Medium	12.5
	Improve control and valuation of diamonds	Increase declared volume and value of diamond exports and reduce fraud	Restructure and reform CEEC (diamond valuation office) through operational and financial audits, recruitment and training of staff,	MOM, CEEC, technical assistance and outsourcing of part of valuation functions	High	5.5

			international oversight and counter valuation			
	Improve financial and economic analysis of projects	Produce regular financial, economic and technical assessments of proposed projects	Train staff of Ministries of Mines and Finance (CTCPM, among other agencies) in principles of project financial/economic analysis, mining accounting, finance, taxation and governance	MOM, international technical and training assistance	Medium	1.0
	Improve surveillance of value and volume of mineral exports	Increase in the declared value and volume of mineral exports, principally in Katanga province	Reinforce government laboratories and/or provide contracts to private laboratories to assay and determine value and volume of mineral commodity exports through principal ports of exit	MOM, OFIDA, OCC, internationally certified mineral testing laboratories	High	5.0
	Improve state of geological information and data	Produce new geological maps at regional scale for 50% of country not yet covered, using modern cartography, geophysical, geospatial, and geochemical techniques	Provide technical and contractor assistance to Ministry of Scientific Research to digitize existing information, produce new maps and cartography, repatriate to DRC information stored overseas, rehabilitate research institutes and universities	MRS, international experts and consultants	Medium	92.0

Table 14. Maximize Contribution to Economic Development of Mineral Endowment

Objective	Goals	Output/Results	Activities	Interested parties and nature of assistance	Priority	Cost (US$ M)
Ensure the maximum contribution to overall economic development of DRC mineral assets and endowment	Reform and restructure parastatal companies	Entry of private owners and managers in all SOEs by 2009 and realization of fair market value for mineral assets	Adoption of legislation to facilitate dis-engagement of State as owner of SOEs, facilitate entry of private capital and managers,	MinPort, MOM, technical assistance	High	0.5
			Conduct valuation of assets, tendering procedures for mineral and other assets	MinPort, MOM, SOEs, int'l and local consultants	High	15.0
	Reduce administrative constraints and "hassle" factor for private sector companies	"Doing business indicators" in DRC; ratings to move from current bottom position to mid-level of countries surveyed by 2009	Identification of key constraints and hassles and adoption of a vigorous program of to remove them, including elimination of many permits and regulations and establishment of "one-stop" shop for investors	MOM, technical and legal assistance	Medium	5.0
	Improve road, rail, and power infrastructure in key mining areas	Reduced transportation times and cost; reliable power supply to mines	Support to government to restructure SOEs involved with infrastructure, development of appropriate regulatory frameworks, rehabilitation and/or construction of new road, rail infrastructure; this activity needs to be coordinated with the recently announced Chinese loan for infrastructure development	MOM, technical assistance and direct funding support	High	125.0

Table 15. Improve Conditions for Artisanal and Small Scale Miners

Objective	Goals	Output/Results	Activities	Interested parties and nature of assistance	Priority	Cost (US$ M)
Improve conditions for artisanal and small scale mining	Improve security of tenure for artisanal miners and reduced conflicts with industrial operators	Reduction in conflicts between industrial and artisanal miners through establishment of 10 viable "artisanal mining zones" within next 24 months; elimination of barriers to regularization of artisanal mining	Government should set aside artisanal mining zones in key producing areas with access to transport, water, and infrastructure; police and control activities in the zones; elimination of the US$25 diggers card fee; dissemination of mine law	MOM, SAESSCAM, Technical assistance, logistical and materiel support	Medium	4.5
	More clearly distinguish in the Mine Law the artisanal and "small scale mining"	Facilitate the development of small scale industrial operations which are presently hampered by lack of clear criteria and definitions in the Mine Law	Adopt regulations and criteria to define the special "small scale mining" permit as provided for in the Mine Law	MOM, Technical and legal assistance to Ministry of Mines	Medium	0.5
	Establish artisanal miners cooperatives	At least 10 such cooperatives fully functional and viable within 24 months	Facilitate the creation of artisanal mining cooperatives through adjustments in civil code, provision of technical assistance and training to the cooperatives	MOM, SAESSCAM, Local technical assistance, civil society organizations	Medium	2.0
	Improved enforcement of labor, health, safety and environmental standards	Increase in number of site inspections per year by government inspectors qualified to evaluate conditions in artisanal workings	Create and staff specialized unit and/or reinforce existing units within provincial mines offices to verify and conduct inspections and verifications of artisanal mining sites, beginning in Katanga province	MOM, Local technical assistance and logistical support	Medium	2.0
	Improved productivity in	Increase recovery factors and efficient production of	Extension services by SAESSCAM and other government/NGOs to	MOM, SAESSCAM, local and international	Medium	15.0

	artisanal mining	minerals in raw form	artisanal miners to provide technical assistance, skills upgrade, and equipment.	technical assistance, equipment, and logistical support		
	Improved beneficiation of minerals	Decrease in volume of raw non-beneficiated minerals currently exported	Establishment of pilot beneficiation and value added facilities in key mineral producing provinces and/or commodities. Careful consideration should be given to establishment of cutting and polishing centers for precious stones.	MOM, SAESSCAM, technical assistance from local and international experts, NGOs	Medium	15.0
	Development of alternative livelihoods	Creation of alternative livelihoods for 10,000 artisanal miners over next 2 years	Support to local communities, NGOs and companies to create alternative livelihoods and jobs for artisanal miners for certain areas on a pilot basis. Particular attention should be paid to employment and supplier linkages with industrial companies	MOM, NGOs, technical assistance, equipment, and logistical support		5.0

Table 16. Improve Environmental and Social Issues in Mining Areas

Objective	Goals	Output/Results	Activities	Interested parties and nature of assistance	Priority	Cost (US$ M)
Improve environmental and social conditions in mining areas	Understand the extent and nature of risk posed by various environmental legacy and other problems	An inventory and risk assessment of pressing environmental problems; program to address most pressing issues	Conduct an inventory of pressing and current environmental problems, particularly in Katanga. Develop program to remediate most pressing problems	MOM, technical assistance, international and national consultants,	High	3.0
	Distinguish government from private party liabilities in partnership contracts	Distinction between pollution "stocks" and pollution "flows" in mining contracts; adjustments to contracts; better management of environmental performance of contractors	Conduct baseline study of environmental liabilities to distinguish pre-existing conditions and new pollution issues; develop adjustments to contracts as necessary; ensure compliance with obligations on part of contractors.	MOM, technical assistance, private contractors, government agencies	Medium	3.0
	Internationally competitive environmental regulations	Government and private companies better able to assess, remediate and control environmental issues related to mining operations	Improve existing regulations and/or prepare and adopt new environmental regulations for the mining sector that are competitive and in accordance with international standards	MOM, legal and expert technical assistance	Medium	2.0
	Better enforcement and compliance with environmental regulations	Strengthened government institutions responsible for monitoring environmental compliance; trained and capable environmental inspectors	Prepare aggressive strengthening program for government institutions charged with enforcement of environmental regulations; equipment supply and logistical support; training of personnel; this activity maybe out-sourced and/or combined with	MOM, technical assistance, local and international specialists	High	5.0

			mines inspection function.			
	Develop a program to work with artisanal miners on environment awareness matters	Artisanal mining operations are better able to control and prevent environmental pollution	Conduct sensitization program, perhaps on pollution prevention and control; possibly combine with occupational health and safety training; these activities could be carried out by a NGO.	MOM, SAESSCAM, NGOs, technical specialists	Medium	3.0
	Ensure that the rehabilitation financial guarantees are effectively reported and used for purposes required	Funds for remediation are effectively available when required and used for the purposes stipulated.	Reform and amend current practices of collecting up-front payments in favor of system of performance guarantees; better tracking, traceability and responsibility for funds deposited for environmental remediation.	MOM, government, technical assistance	High	0.5
	Effective community consultation	Improved relations between communities and mining companies	Adopt procedures and guidelines for consultation between communities and mining companies; enforce compliance with Mine Law and regulations to require reporting of consultations in order to issue and/or renew mineral rights	Ministry of Mines, CAMI, local and international expert assistance	Medium	2.0
	Provide for continuation of social services provided by SOEs	Continued access by communities to physical and social infrastructure previously supplied by SOEs	Conduct studies to transfer physical and social infrastructure services of SOEs to appropriate third parties; coo9operate with private sector investors in this respect; solicit donor funding for assistance	SOEs, bilateral and multilateral donors, private sector managers and operators of SOEs	Medium	10.0

Annex 1
Long Term Commodity Prices

"The Outlook for Metals Markets"
Bank Staff Report
September 2006

Executive Summary

Metal Prices are at all time highs in nominal terms

International metals prices have risen substantially the last three years and are at all time highs in nominal terms, and in some cases match or exceed the highest real levels seen in the last thirty years. Prices are significantly above long-run average costs of production. The recent run-up in prices is broadly consistent with the pattern of past metals price cycles, although prices have risen more strongly and high prices could be extended longer than has been typical in the past.

Prices have been driven up by a number of factors. Demand growth increased sharply, particularly in China, and caught the industry by surprise and helped drive inventories to low levels. Investment and expansion of mining capacity had earlier been discouraged by a long period of low metals prices with uncertain future prospects and poor corporate returns. More recently prices have been driven even higher by technical and labor problems, and delays in bringing on new capacity.

Chinese demand growth has been a major factor

A particular feature of markets has been the importance of Asia and particularly of China in accounting for growth in demand. Over the fifteen years since 1990, Chinese metals demand growth has averaged 10% pa, and in the last five years it has accelerated to 17% pa. Chinese metal demand has been driven by fast growth in industrial production, and investment in infrastructure, construction, and manufacturing. For a number of metals, China accounted for 70% or more of global demand growth in last five years, and the country is now the world's single largest user of almost all metals.

Over the same period, China also made substantial investments in metals mining and processing and its own production has grown strongly. It is the world's largest miner or refiner of a number of metals and, by any measure, one of the world's leading mining countries. In products such as copper and iron ore, where its production of processed metal or ore has lagged growth in its demand, it has emerged as major source of demand for refined metals and raw materials on world markets.

Higher prices are bringing strong benefits to producer countries and investors

High metals prices have brought substantial benefits to metals producing countries and to investors. Company profits have increased substantially and tax revenues will follow. The mining industry is flush with cash, share values have soared and exploration and investment spending have both risen significantly. High metal and share values have encouraged further acquisition activity in the industry and have also attracted new entrants to

international financial markets from countries as diverse as Russia, India, Kazakhstan and China.

But also imposing costs

High prices and profits, though, are bringing in their wake a number of issues that the industry needs to deal with. Rising investment spending has led to inflation of mining costs, as the mining supply and service industries have been pushed up against capacity constraints and their costs and prices have risen. The industry is also facing higher oil and other energy prices, as well as strong upward pressure on wages due to a limited supply of skilled workers. As the costs of mining investments are being pushed up, in some instances projects are being delayed.

High prices and profits have also attracted the attention of some governments who, in the face of large profits being earned by investors, have come to feel that they are not receiving an adequate share of the benefits from the development of their national resources. Fiscal terms and conditions are sometimes being changed to capture more for the state. This could delay new investments as investors and governments struggle to reach mutually acceptable terms.

Metals prices will come down

Demand growth looks likely to remain buoyant for the immediate future with most forecasters predicting continuing strong Chinese economic growth and investment. At the same time though, high prices are having some impact on demand, and supply will respond to prices that are significantly above the costs of metal production. It is expected that prices will start to come down the next year or so and eventually settle at levels that are closer to the average of the period 1990-2004. However, prices are likely to be somewhat above previous lows as a portion of the increase in costs remains permanent. The exact timing and pace of the inevitable fall in prices from today's levels is uncertain and will depend on a number of factors and could vary by metal. There are a number of risks that could prolong the period of high prices such as faster global economic growth and interruptions to production and new investment. Conversely, if growth slows more quickly than expected, particularly in China, the fall in prices could come sooner and be much sharper.

Longer term metals demand growth is potentially very strong

Partly as a result of China's rapid growth, developing countries now account for close to 50% of global demand for metals. Developed country metals demand growth leveled off some time ago and is likely to grow only slowly in the future although it will vary by metal. The potential for long-term demand growth from developing countries, however, is very large. Metals use is strongly correlated with economic growth, particularly growth in industrial production, and associated developments such urbanization and rising incomes. If developing countries are to reach the standards of living of rich countries, their metals use will tend to rise to similar levels.

Today, metals consumption per head in developing countries – whose population in aggregate is more than five times as large as the total of the developed countries – is often one quarter or less that of the rich countries. While the future path of the world's developing countries approaching developed country levels of income is uncertain and could be extended, China's recent experience shows how quickly metal demand can grow when economic growth is fast.

Developing new supplies will be challenging

For more than thirty years, the world's mining industry has been able to supply growing amounts of metals to world markets at gradually falling real costs. It has been able to do this despite declining ore grades and tighter environmental and social constraints on its operations. A broad-based and diverse range of incremental improvements in mine operation and processing, including large open pit mining operations that helped realize economies of scale, were responsible for ensuring declining costs. In addition, major breakthroughs have occurred, such as the introduction of leaching technology in the production of copper, and, more recently, the development of pressure acid leaching for the recovery of nickel from laterite deposits.

Looking forward, the potential absolute size of future demand growth the industry will need to meet will be larger than ever. For the foreseeable future the resource base is not likely to be a major constraint. But, the industry is likely to face continuing challenges in terms of higher energy costs, potentially higher exploration costs, declining ore grades, and increasing environmental and social constraints, including water issues. There may be less scope for reaping gains from major economies of scale due to a growing share of large open pit mines, and new mines may more often be located in remote locations with greater infrastructure costs.

But past experience of a dynamic, market-driven industry gives grounds for optimism

The competitive and international nature of the mining industry has been the key to meeting global demand for metals. While the role of the private sector relative to the state has waxed and waned over time, developments over the last two decades in particular mean that the role of the private sector and the global inter-dependent nature of the mining industry will increase substantially. More of the world's mining industry is now in the private sector and greater subject to market forces than ever before. More parts of the world are engaged in international metals trade and the role of mining companies from countries such as China, Russia, Brazil, South Africa and elsewhere looks likely to increase markedly.

However, the process of continuing internationalization of the industry has some way to go, is not likely to be entirely smooth, and there could be reversals. Important major mining countries are not yet fully open to private investment, even though that is where they are heading. Some governments today are concerned about the sharing of benefits between themselves and private investors, and of adding value to their resources as opposed to exporting raw materials. In some countries, there has been a resurgence of economic nationalism that appears aimed at restricting foreign investment in the extractives sector, or, at least denying it a leading role. Among established international investors, there are concerns about fair competition for access to resources when competing with state-supported companies. There are also concerns about the application of common good-practice standards for environmental and social issues, especially in developing countries where government capacity may be weak.

Nevertheless, a broad trend towards a more private-sector/market-based approach looks likely to remain the direction in which the industry will continue to move. This and increased internationalization augur well for a more competitive industry that is better able to meet global demand for metals at reasonable costs.

Price trends will not be dramatically different from the past

The precise long-term trend of metals prices, once the current cyclical high ends and prices revert back towards trend, is uncertain. The path taken will be the net outcome of a range of complex forces on both the demand and supply sides of the market. Rapid world

economic growth, particularly fast growth in developing countries, will pose significant challenges. Available knowledge about the resource base and opportunities facing the industry suggest that a competitive, international industry will continue to meet growth in metal demand at reasonable cost, as it has done in the past. However, it is possible that the trend decline in real prices that has been a feature of the last forty years or so could be stopped and reversed to some extent. Real prices, though, look unlikely to stay substantially above past long-term trend levels for sustained periods.

Policy Implications

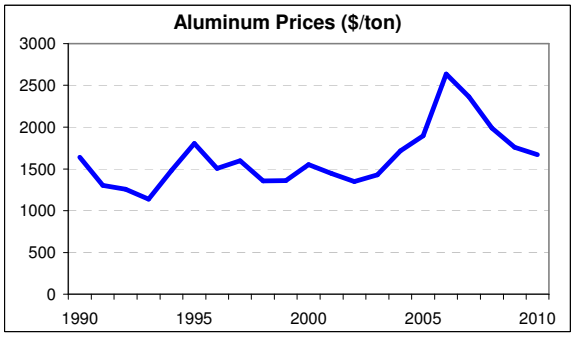
High metals prices do not appear to pose any urgent short-term issues for the global economy. While higher metal prices may impact inflation, the scale of the metals industry is relatively small in relation to the size of the global economy and international trade. The metals industry is much smaller in this respect than the oil industry, and the world has coped well with high oil prices. Moreover, the current period of high metals prices is not necessarily out of line with past price cycles.

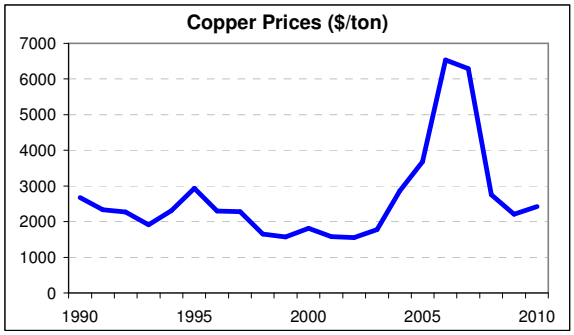
For some individual "resource rich" economies, high metals prices can bring substantial tax, foreign exchange and new investment inflows. These will need to be managed, as will the fall in prices and investment flows should prices follow their expected cyclical path. There is no immediate role for governments in short-term metals supply management. Markets are working to balance supply and demand, and higher prices are a part of this process.

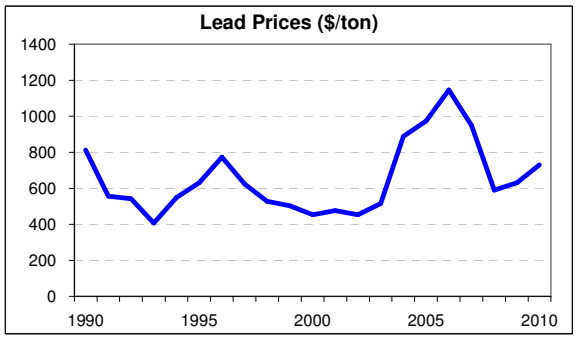
For the longer run, the key message for government policy makers is to help facilitate access to resources for development, and by providing for a well regulated and internationally competitive mining industry. While there are a number of important roles that governments should play to support the competitive development of their mining sectors, there does not appear to be any pressing need for them to take a role in normal commercial decisions about investment (including exploration) and operation. Allowing markets to work seems to be the best approach to ensuring that the metals industry can effectively meet the demands placed upon it. As the industry becomes more international and countries more inter-dependent, the focus of governments should be on helping facilitate this process and in addressing market imperfections, such as inappropriate barriers to local and foreign private investment, and subsidies and protection for local production.

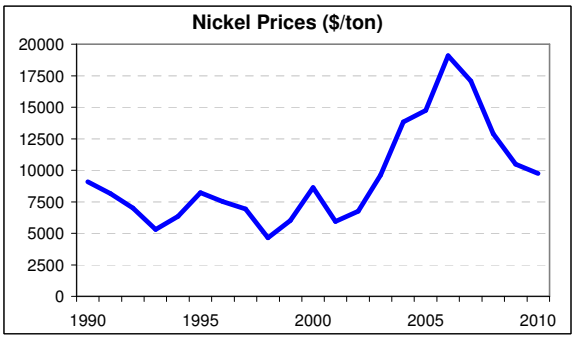
There is a common interest between investors, host governments and the international community, to ensure that producing countries and local communities do receive sustainable benefits from the development of their metals resources. This will contribute both to the welfare of these countries and communities, and will help ensure more effective development and operation of the international metals industry.

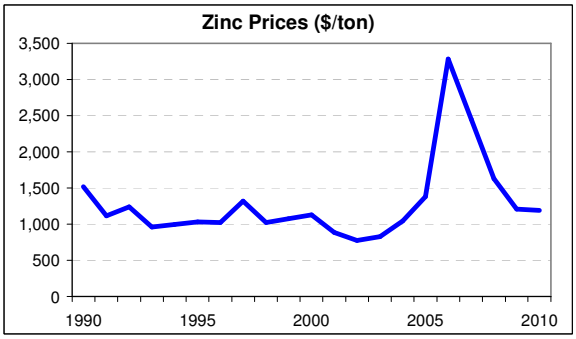
1. *Refined Metals Prices 1990 – 2010*

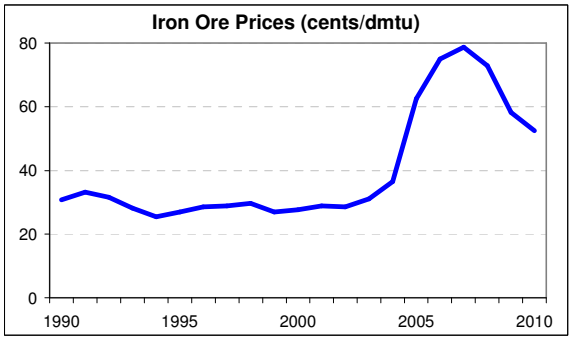


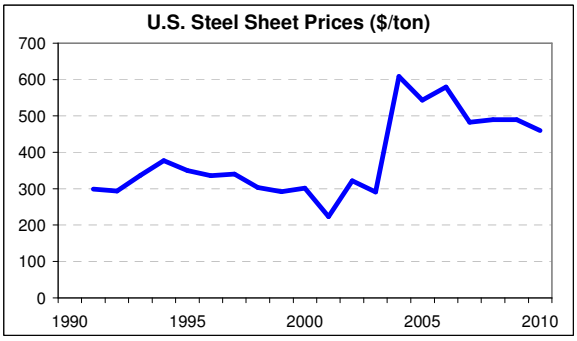


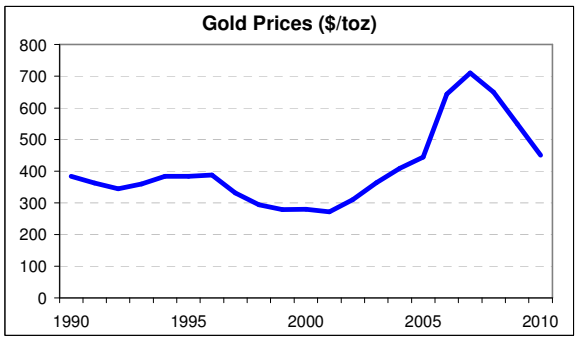












Annex 2

Evaluation of DRC Mineral Resources

Report prepared for the World Bank by Pierre J. Goossens, mining consultant

November-December 2006

Table of contents

Executive Summary

Four main regions of the DRC are rich in minerals: Katanga, Kasaï, NE Congo and Kivu-Maniema.

In the Katanga province, the copper belt contains world class resources of copper and cobalt. In addition, the Kipushi ore body is one of the largest zinc-copper-germanium deposits in the world. The Shinkolobwe uranium mine is now closed however the resources in uranium remain attractive. Uranium mineralization is also present within some of the copper-cobalt ores.

The total copper metal produced from the beginning of mining up to 2003 is estimated at 18 Mt, the cobalt at 0.5 Mt, the zinc at 3.6 Mt and the germanium at 0.28 Mt.

The annual copper production peaked in 1982 with 542,000 t. From that year until 2003 the copper production decreased to some 30,000 tpa. With new joint ventures between Gecamines and mining entrepreneurs, however, the present (2006) production is estimated at about 150,000 tpa of copper and 10,000 tpa of cobalt.

Currently the identified resources of the Katanga Copper Belt are estimated at **70 Mt of copper**, **5 Mt of cobalt and 6 Mt of zinc**. These amounts classify the Katanga Copper Belt to the top of the rich copper regions of the world, just below that of Chile[57]:

- Chile: 88 Mt
- **DRC: 70 Mt**
- USA: 45Mt
- Russia: 20 Mt
- Poland: 20 Mt
- Indonesia: 19 Mt
- Peru: 19 Mt.

The Katanga Copper Belt contains the largest known cobalt resources in the world.

The Kipushi zinc deposit (resources: 5 Mt of zinc) and the Big Hill (resources: 1.2 Mt of zinc) represent 3% of the known total reserves of zinc metal in the world (Crowson, 2001).

In the provinces of Kasaï Occidental and the Kasaï Oriental, diamonds are mined from alluvial and eluvial deposits, and kimberlitic pipes, but only 5% of the diamonds are of gem quality. Diamonds are also known in Katanga, Kivu and in the north of the country adjacent to the Central Africa Republic.

DRC owns the largest known diamond resources in the world in terms of volume. However, in terms of value (ie. Gem quality diamonds) the DRC comes after Botswana and Russia.

Rich deposits of gold have been exploited in the districts of Kilo and Moto, both located in the Ituri region, NE of DRC. In the Kivu and the Maniema provinces gold exploitation was also active. These gold rich regions still contain world class gold deposits. In the copper belt (province of Katanga), gold has been recovered from the copper blister refinery (together with platinum and palladium).

The geological context of gold in the NE Congo is very similar to other Precambrian rich gold regions in the world. The existing resources in the Moto district are approximately 500 tons of gold. In the Kilo district, it is difficult to estimate the resources but they must be much higher than in the Moto district, due also to higher grades. .In the provinces of Kivu and

[57] Crowson, 2001, Minerlas Hanbook

Maniema, the existing and identified resources and grades are sufficient for several open pit operations.

The eastern part of the DRC is rich in alluvial deposits of cassiterite, tantalite, colombite ("coltan"), and wolframite. Rich pegmatites are known and some of them have been exploited (eg. Manono).

In the Bas Congo province several copper-rich veins (sometimes with lead and zinc) and rich massive copper oxides are known to be present within the limestone. The deposits are small but with the today copper prices, one or two can be considered economic.

The huge sedimentary Congo Basin ("Cuvette Centrale") has been drilled (very limited number of drill holes) for its oil potential. Interesting oil shales have been intersected. The cuvette remains potentially open to further exploration.

Several ultramafic bodies exist in the DRC. None have been systematically explored for their nickel and PGM potential. Occurrences of platinum nuggets in the heavy mineral concentrates during gold exploration have been reported in several regions, principally in the Kivu province.

In June 2002, after the approval by the General Assembly of the new Mining Code, the cadastre Minier (Registry) opened the door for the registration of new exploration and exploitation titles. There was a rush by national and international junior and big mining companies. A new life for exploration had started in the country. Two years later the entire potential surfaces had been covered by exploration permits. Despite the maximum surface area a company may acquire the titles to being fixed by law at 20,000 km² some large state companies, such as Miba and Gecamines, continue to hold much larger areas.

In terms of strengthening the government mining administration a lot remains to be done. The Registry deplores a lack of IT facilities and training. The number of titles delivered in the last four years is probably the largest number delivered by an African country in such a short period of time. The facilities present should be adapted to enable an efficient handling of the difficult administrative task required. The absence of a Geological Survey has prevented several European countries from contributing in digitizing the mining files existing in their archives and delivering them to an organized administration in Kinshasa.

One of the main problems facing the mining industry, beside the lack of infrastructure, is the hundreds of thousand of artisanal miners dispersed in each of the rich mining districts: Katanga, Kasai, NE Congo, Kivu and Maniema. The social problem is a major one and the government together with the mining companies will have to take positive action in order to liberate the ore deposits from these artisanal miners.

Introduction

The principal reason for the Congo's prosperity in the years leading up to independence in1960 was its mineral wealth, which then accounted for two thirds of the value of its exports. The country possessed a wide range of minerals of which the primary source of wealth were the metals copper and cobalt, primarily found in Katanga and where Union Minière controlled most of the production. At one time the Congo was the world's fourth largest producer of copper and was supplying 55% of the world's cobalt. Gold was produced in Katanga, north of the Ituri region and was also mined in other areas such as in the Kilo-Moto belt in the north east of the country. Gold production was controlled by major holding companies and the Congo ranked among the world's top fifteen producers. Both gem and industrial diamonds were produced in the Kasai, and the Congo ranked as the world's largest producer of industrial stones. Tin was found in considerable quantities at Manono, in Katanga. Manganese, zinc, wolfram (tungsten) tantalum, coal and iron were produced in quantities of varying importance. In addition to all of this the Congo at one time produced 60% of the 'free' world's supply of uranium.

Since independence, mining activity remained the country's principal industrial activity. Since 1967, the DRC (then called Zaire) government nationalized the private enterprises (Gécamines) or acquired a majority in the mining companies (Miba). Despite the rich mineral provinces these state companies became non-profitable. Other service activities such as transport, energy and telecommunications also became problematic and ceased to render good services to the mining activities further aggravating the situation.

The formation of Gécamines and other state enterprises was of fundamental importance to the current situation prevailing in the DRC. In deciding how to administer the mining industry President Mobutu initially retained the "concessionnaire" system created by Belgians, but in 1966 changed the law so that the state owned all land and mineral rights in *Zaïre*. In 1967, Mobutu nationalized the Belgian private mining giant Union Minière du Haut Katanga (UMHK) and created the state owned mining enterprise, Gécamines (Générale des Carrières et des Mines).

During his first two years as President (1997-8) Laurent Désiré Kabila generated revenues quickly by striking deals granting mining concessions indiscriminately, disregarding lengthy negotiations that were then on-going with several major companies. Mismanagement of the country's natural resources continued as the government exercised virtually no control over public enterprises such as Gécamines.

The DRC mining industry is still profoundly dependent on the various state owned mining organisations which effectively control the majority of the production:

- Gécamines, in Katanga, holding copper-cobalt and zinc mines. Gécamines controls all mining activity in the Katanga province,
- MIBA (Minière de Bakwanga), in Kasaï, a major producer of diamonds,
- OKIMINES, in Ituri, which holds gold permits,
- EMK-Mn, in Katanga, with its manganese mine,
- SOMICO, in Katanga and Kivu, holding tin, wolfram and gold permits and
- SOMINKI (Société Minière du Kivu), in Kivu, holding tin permits.

1. Summary of the Mineral Resources of the DRC

The greater part of the Congo is covered by the sediments of the *Cuvette Centrale* (the Congo Basin). Only alluvial tin, gold and diamonds have been occasionally found in this vast region, although it may eventually turn out to be a source of industrial mineral deposits such as phosphates, clays and hydrocarbons. For example bituminous shales have been found and drilled.

However, around the *Cuvette Centrale* there are older rocks exposed which frequently carry mineral resources. The Crystal Mountains in the Bas Congo province have some relatively small polymetallic deposits of zinc, lead, copper and gold. To the north and north east the Archaean rocks carry gold in the Kilo and Moto areas along with other greenstone belts, and has also become a source of alluvial diamonds. In the east the Kibara Belts host pegmatite minerals such as tin, tungsten and niobium-tantalum ('coltan'), along with gold in Kivu and Maniema at Kamituga, Twangiza and Namoya. However, the chaotic state of these areas has resulted in the replacement of formal mining operations by production from artisanal miners.

In the south the Archaean rocks of south Kasai and Katanga have numerous kimberlite intrusions, with a major diamond industry based on them. There are also coal fields in eastern Katanga and manganese ores to the west.

However, the major mineral resource of the country is to be found in the Proterozoic domain of Katanga, part of the central African copperbelt, estimated to contain more than 140 million tons of copper and 6 million tons of cobalt. Almost all of the copper, cobalt, uranium, zinc, lead, cadmium and germanium production of the DRC has come from this 'Lufilian Arc', which stretches for 500 km from Bwana Mkubwa in Zambia to beyond Kolwezi in the DRC. Over 236 copper-bearing occurrences have been reported from the region.

2 Copper-Cobalt, Zinc and Germanium, and Uranium in the Copper belt of Katanga

2.1 Historic

Industrial copper production started in 1911 at the l'Etoile (Ruashi) a very rich copper oxide deposit located a few kilometers from Lubumbashi.

Union Minière du Haut Katanga's (UMHK) mines in Katanga were developed in three groups – in the south around Elizabethville (Lubumbashi), in the centre around Jadotville (Likasi) and most prolific of all, in the west around Kolwezi. UMHK operations were highly profitable and in 1959 made a net profit of £32 million and had a market capitalisation of approximately £177 million (unadjusted). In 1960, in the midst of conflicts and secession, the company still produced 301,000 metric tons of copper, 8,240 metric tons of cobalt, 192,000 metric tons of zinc, 1,079 metric tons of uranium oxide, 26.100 kilograms of germanium and 124,000 kilograms of silver.

In 1967, UMHK was nationalized and its activities were taken over by a state-owned company, the Generale des Carrières et des Mines (Gécamines).

2.2 The Katanga Province

The DRC province of Katanga, located in the south east of the DRC, is certainly the country's most developed region. Katanga shares its international borders with Zambia, Tanzania and Angola. It is surrounded to the north by the Congolese provinces of Kasaï Occidental, Kasaï Oriental, Maniema and South-Kivu. The capital of Katanga is Lubumbashi (formerly Elisabethville).

Most of Katanga consists of a plateau at an altitude of about 1,500 meters. It has a pleasant Savannah climate with rich grasslands, and in its heyday was famed for its cattle ranches.

A railway system exists from Lubumbashi to Zambia (and from Zambia the line links to either South Africa or to Dar es Salaam, in Tanzania). Lubumbashi is also linked by rail to Kolwezi, through Likasi, and from there to Lobito in Angola and the Atlantic coast (the Benguela railway).

The formerly extensive road network that linked major mineral producing areas and cities to the national network is now in very poor condition due to lack of investment and maintenance. Hydroelectric power is supplied from two major local dams, and in 1976 the Inga-Shaba power line, over 2,000 km long, connected the local grid into power supplied by the giant Inga dam hydroelectric scheme in Bas-Congo near the Atlantic coast.

The construction of the Inga-Katanga power line by Morrisson Knudsen was conditional upon the financing and construction of the Tenke Fungurume mines (by an Anglo American led international consortium), as the existing power supply would have been inadequate for the refinery needs of the new mine and for the planned expansion of Gécamines' overall production. The project was abandoned following the collapse of the copper price following the creation of Opec and the resulting oil shock. Repeated invasive attacks from nearby Angola by Katangese rebels in 1976-1977 also doomed the project to failure.

2.3 Brief Summary of Katanga Geology

The copper province of Katanga is part of the Central African Copper Belt (including DRC and Zambia), one of the richest copper provinces in the world. Besides copper, the belt is also rich in cobalt, zinc (and germanium) and uranium. All of these metals have been produced from the region in the past.

The geological formations of the DRC are divided into the following main structural units:

1. The Congo shield.
    1. Archean rocks
    2. Proterozoïc rocks
    3. Upper Precambrian rocks
2. The Congo Basin

3. The Lufilian Arc
4. The West Congo
5. The Rift region.

The Katangan Arc, 300 km long (from Kolwezi to south of Lubumbashi) and 50 km wide, is located to the East of the Congo shield. The sediments of the Upper Precambrian, the Katangian (1,300 to 600 Ma) were deposited within a huge intracratonic basin were affected by the Lufilian orogeny (~725 Ma). The Katangian is composed of three sedimentary supergroups separated by two paraconglomerate glacial deposits which affected the entire basinal environment. From bottom to top these three supergroups are: the Roan, the Lower Kundelungu and the Upper Kundelungu.

Of the three supergroups, the vast majority of the known deposits within the Katanga copper arc are located within the Roan supergroup. Lithologies within the Roan supergroup vary from pelite to psammite and dolomite; slight metamorphic alteration can also be observed. More than 230 base metal occurrences have been recorded within this supergroup. The majority of the mineralization present is located within the aptly named Mines group (R2). These sediments are located at the base of the Upper Proterozoic Katangian system which is part of the sedimentary series related to the filling of an intracratonic basin.

The Arc is host to extensive high-grade copper-cobalt mineralization in very large stratiform deposits.

The mineralization appears to be syngenetic, generally Cu-Co (copper-cobalt) and is stratiform, being finely disseminated within carbonaceous sequences. The deposits are particularly well controlled by the palaeogeography. These sediments are rich in organic materials and evaporite minerals suggesting a shallow water environment. Furthermore these mineralized sediments appear to have been deposited not far from shoreline. They are found to be above partially oxidized coarse-grained sediments and are covered by thick impure carbonate sequences. Sulfide textures (chalcopyrite, bornite, chalcocite, carrollite and pyrite) show a replacement succession. For example, pyrite is replaced by chalcocite or bornite or chalcopyrite, and then replaced by carrollite and linnaeite. These geochemical replacements have a diagenetic origin. The Mines group has been affected by a large degree of tectonism resulting in a heavily faulted and folded sedimentary series breaking up these stratiform deposits.

Within this region, in addition to the above copper-cobalt mineralization, supergene mineralization has been discovered consisting of strongly oxidized Cu and Co mineralization. An example of this form of enrichment can be seen at the l'Etoile deposit where the Cu and Co has been oxidized to malachite, azurite and heterogenite.

There are also high concentrations of zinc and uranium within the same sedimentary group, related to hydrothermal veins. All of these metals have been found in economic quantities and have been extracted in the past. Despite the known presence of sulfides within the region, today only small amounts of copper are produced from sulfides.

One of the particularities of the Katanga copper belt is the rate of oxidation. While in the Zambian copper belt, most of the mining is in sulfide ores, in Katanga, most of the mining is in the oxide ores. Hence, when Gecamines was in trouble and the mining activities in jeopardy, thousands of diggers started to collect heterogenite (rich cobalt oxide) found at the surface. When the price of copper rises up to high values, the diggers also started collecting rich malachite (rich copper oxide) fragments. Both hand picked concentrates (10 to 15%

cobalt and about 30% copper) were sent first to the smelters in Zambia. Due to this profitable activity, many small furnaces were built in Lubumbashi, Likasi and Kolwezi to produce from these concentrates cobalt alloys and copper blister (90 to 95% copper). The number of these diggers has been estimated at 100,000 persons.

2.4 Structure of Gecamines

Gecamines, the largest mining state enterprise in DRC, was created in 1967 following the nationalization of UMHK (Union Minière du Haut Katanga).

Gecamines/Exploitation is a subsidiary of Gecamines/Holding. Gecamines/Exploitation is responding to a board of directors, to an executive committee and to a college of auditors. The official purpose of Gecamines/exploitation is the exploration and exploitation of ore bodies, the processing of the mineral products and their sale.

Today, Gecamines has a debt to clients of over US$ 1.5 billion.

Gécamines is currently the largest public company in the DRC. It currently employs around 24,500 people (including 60 expatriates). Gécamines' mining concession covers 32,000 km². For administrative purposes, the company's assets are split into three groups:

Southern Group, around Lubumbashi,

Central Group, around Likasi and

Western Group, around Kolwezi.

Gécamines has a range of processing plants including mineral concentrators at Kipushi, Kambove, Kakanda and Kolwezi and metallurgical plants at Likasi (Shituru, annual nominal capacity: 135,000 tons of copper and 8,000 tons of cobalt), Kolwezi (Luilu, annual nominal capacity: 170,000 tons of copper and 9,000 tons of cobalt) and Lubumbashi (annual capacity; 165,000 tons of copper). Metalkat, the metallurgical plant built to process zinc concentrates from the Kipushi mine is located near Kolwezi due to the presence of nearby hydroelectric power stations. The total nominal capacity of these plants is 470,000 tons a year. Most of these facilities are in need of almost total refurbishment. At Panda, there existed an electrolytic plant for Cu-Co concentrates.

The processing plants nominal capacity 530,000 tons a year.

- During 1996 and 1997 (in the last days of the Mobutu regime), several foreign mining and exploration companies signed joint venture agreements with Gécamines to rehabilitate 20 copper-cobalt and zinc mines together with associated processing facilities. After the accession of Laurent Kabila as President in 1997, several of these contracts were reviewed.
- Gecamines' metal products were shipped through Matadi, South African ports, and Dar-es-Salam. The copper products are mainly sold in Europe. Today, due to the deterioration of the existing infrastructure and the strong decline in production, concentrates find their way to the smelters in nearby Zambia

As shown in the table below, production of copper, cobalt and zinc by Gécamines has experienced a very significant decline over the last decade.

Table 1. Gecamines Historical Production

Year	Production (metric tonnes)		
	Copper	Cobalt	Zinc
1980	471,000	6,800	29,600
1981	440,600	3,400	87,800
1982	542,600	7,300	55,000
1983	525,600	9,500	66,600
1984	490,400	10,000	67,800
1985	490,000	10,000	66,000
1991	222.097	8620	28321
1992	134.952	6547	18833
1993	45.909	2092	4147
1994	29.323	3274	595
1995	32.512	3967	
1996	38.882	6067	
1997	36.427	3032	
1998	37.277	3869	
1999		6000	
2000		7000	
2001		4700	
2002		4000	

2.5 Past and Present Production, Development and Exploration

From the beginning of copper exploitation in the Katanga province, through UMHK (Union Miniere du Haut Katanga), in 1911 until 1967, and then through to 2003 under the direction of Gécamines, approximately 18 million tons of copper metal have been produced.

From 1924 until 2003, about 500,000 tons of cobalt have been produced as a by-product of the copper.

The zinc production from 1936 until 2003 was about 3.6 million tons of metal.

From 1954 until 2003, about 280,000 kg of germanium were produced.

The following table summarizes the existing resources[58] non-exploited in the Katanga (primarily in the copper belt).

Table 2: Summary of the resources of the Katangan Copper belt

Deposit	Reserve/resources	Mt	Copper %	Cobalt %	Silver g/t	Zinc %
Kambove West	resources	6.5	4	0.45		
Kamfundwa	resources	7.3	3.3	0.3		
		10	1.4	0.2		
Big Hill						
Kamoto	resources	66	4.4	0.5		
	reserves	15		2.2		
	reserves	8				1
Kamoya	resources	10	2.7	0.45		
Dikulushi						
Kamwali	resources	1.56	4.92	1.96		
	resources	1.3	8.11		238	
Kapulo	resources	1.12	4.73			
Karavia (Kasonta-Lupoto Polygon)	resources	0.044	5.38			
Dikuluwe	resources	168	3.71	0.3		
Kasombo and Mashamba						
Dipeta	resources	197	4.37	0.22		
Kasonta (Kasonta-Lupoto Polygon)	resources	1.5	5.18			
Etoile	(see Ruashi)					
Kazibizi	resources	1	3.2	0.6		
Fungurume and Tenke	total resources	229	4.42%	0.31		
Kinsenda	resources	10	5			
Kinsevere	resources	5.7	3.7	0.11		
Kipapila	resources	2.6	4.4	0.54		
Kipese						
Kabanbakola	oxide resources	0.8	1.1	1.9		
Kipushi	resources	26	2.18			1
	sulphide resources	2	0.8	0.7		
Kabolela North	resources	0.375	3.7	0.7		
Kolwezi	tailings resources	112.8	1.49	0.32		
Kabolela South	oxide resources	0.5	3.1	2.2		
K.O.V.	resources	550	4.59	0.3		
	sulphide resources	2.5	3.2	2.3		
Kulumaziba	resources	6	4			
				0.09-		
Likasi						
Kakanda North	resources	5.8	3.4 - 3.6	0.19		
Lombe	< 100,000 tons of zinc metal					
Kakanda South	resources	5.9	3.36	0.28		
Lonshi	resources	7.3	4.91			
	tailings resources	21.77	1.15	0.15		
Lubembe North	resources	47.5	2.19			
Kakongwe West	resources	3	3			
Lufua (Frontier)	sulphide resources	173.7	1.16			
Kalasi						
Kalakundi	oxide/mixed inferred resources	16.9	3.03	0.66		
	resources	21.3	1.2			
Kalumbwe						
Luishia	proven reserves	6.9	2.7	0.87		
Kalumines						
	probable reserves	50.1	2.09	0.1		
Kamatanda	resources	0.4	4.9			
Luiswishi	resources	8	2.5	1.1		
Kambove	resources	0.5				
Lukuni	resources	2.7	4.3			
principal	tailings: (see Kakanda)					

[58] Resources is used here as geological reserves and do not correspond to the JORC specifications.

Lungeshi				
Lupoto (Kasonta-Lupoto Polygon)	resources	6.7	3.13	
Mindigi				
Mukondo	open pit resources	3.5	5	1.55
			1.84	1.41
Musonoi	resources	30	3.9-5.4	0.4-0.6
Musoshi	resources	110	2.1	
Mutoshi				
Niamumenda (Kasonta-Lupoto Polygon)	resources	0.553	3.92	
Panda	tailings resources: 3.2	7.7	1.52	0.23
			1.63	0.21
			3.7	0.37
Ruashi	tailings resources: 3.2	3.2	1.9	0.6
	orebodies proven and probable reserves	31.9	3.5	0.35
Ruwe	resources (1974)	80	1.95	
Sesa	resources	2	5.6	0.25
Shamitumba	resources	0.015	3.3	0.7
Shanguluwe	resources	0.025	8	
Shinkolobwe	resources of uraninite	0.002		
	resources	2.4		1.6
Shinkolobwe signal	resources	0.125	3.1	1.7
Shituru	reserves	0.085	2	0.05-0.1
	tailings resources	7.28	1.38	0.21
Tilwezembe	resources	1.1	1.6	1.51

N.B. Inferred resources are not accounted except when specified.

From the above table, it can be concluded that the copper belt in Katanga still contains 2 billion tons of copper ore at an average grade of 3.5%, 1.5 billion tons of cobalt ore at an average grade of 0.34% and 34 million tons of zinc ore at an average grade of 18.06%. Germanium, silver, gold, uranium, platinum and palladium are not included.

The Katanga copper belt is one of the richest mineral belts in the world.

Copper and Cobalt

In recent years several companies have signed joint venture agreements with Gécamines for the exploitation of several copper and cobalt ore deposits. Among them, the main presently producing companies are:

Forrest International
Anvil Mining
First Quantum
Metorex

Forrest International is the largest mineral producer and the largest employer in Katanga. At Big Hill, together with OMG (USA) and Gécamines, STL (Société des Terrils de Lubumbashi) about 5,000 tons of cobalt, 3,500 tons of copper and 15,000 tons of zinc are produced yearly from the rejects of the Lubumbashi smelter.

The Big Hill consists of an estimated 25 Mt, in total, of which 12 Mt has an approximate cobalt grade of around 2.2%, together with 6% Zn. The zinc-rich section amounts to about 8 Mt running at 15% Zn. Amongst other metals it is thought that the zinc section contains some 2,500 tons of germanium.

Table 3: Possible composition of the Big Hill Zinc-Rich Resource

Metal	**Grade**
Zinc%	15
Copper%	2.9
Lead%	1.8
Cadmium%	0.15
Gallium%	0.03
Germanium g/t	76
Silver g/t	35

The STL produce is transported to the Kokkola plant in Finland to refine the cobalt alloys.

Forrest Group also mines the Luiswishi copper deposit, near Lubumbashi. The ore is transported for mineral processing to the Kipushi concentrator. The cobalt concentrate is processed in Finland. The annual copper production is estimated at 15,000 t. of copper.

Forrest is also developing the huge Kamoto copper-cobalt deposit located near Kolwezi, where from 1929 until 2005 Gecamines has mined 59 Mt of ore grading 4.21%Cu and 0.37% Co. The Kamoto concentrator and the Luilu plant are to be reactivated.

Anvil Mining is currently exploiting copper and silver at Dikulushi (outside the Katanga copper belt), copper at Kulumaziba and copper-cobalt at Kinsevere. At Dikulushi, the annual copper concentrate production is about 50,000 tons with a copper grade of about 52% Cu and over 4,000oz of silver per ton. The concentrates are transported by trucks to the smelters of Tsumeb (Namibia) or Palabora (South Africa). The Kulumaziba malachite placer deposit is located near Kolwezi. The annual average copper production is 14,000 tons of copper.

First Quantum is currently mining copper at its Bwana/Lonshi copper deposit. The annual production of copper cathode is about 52,000 tons. The same company is developing a new deposit, discovered during an exploration campaign, the Luisha/Frontier, adjacent to the Zambian border, south of Lubumbashi. The total measured and indicated resource is

estimated at 182,068,000 tons of ore at 1.16% copper. The total average annual refined copper production is estimated at 73,000 tons. In addition First Quantum bought recently a majority shareholding in the Kolwezi tailings (a joint venture with Gecamines) which contain an estimate of 107 Mt grading 1.32% copper and 0.26% cobalt. The production is forecasted to be 42,000 tons of copper and 7,000 tons of cobalt.

Metorex has recently completed the feasibility study of the Ruashi ore body and has started mining the deposit. At the beginning the production will be about 10 tpa of copper and 1.1-1.3 tpa of cobalt. After a few years productions will increase to 40,000 tpa of copper and 3,000 tpa of cobalt.

Table 4: Estimate annual production in Katanga for the year 2006

Deposit	Copper annual production, in t. metal	Cobalt annual production, in t. metal	Zinc annual production in t. metal	Silver annual production in t. metal
Gecamines/diggers	30,000	3,000		
Big Hill	3,500	5,000	15,000	
Luiswishi	15,000	5,500		
Dikulushi	26,000			6,220
Kulumaziba	14,000			
Bwana/Lonshi	52,000			
Ruashi	10,000	1,000		
Total	**150,000**	**14,500**	**15,000**	**6,220**

Among the other copper-cobalt deposits in development for future production there are: Tenke Fungurume, Kamoto, K.O.V., the Kolwezi tailings.

The Tenke Fungurume Mining s.a.r.l. (57.75% owned by Phelps-Dodge, 24.75% by Tenke Mining Corporation -the Lundin family- and 17.5% by Gécamines) copper-cobalt deposits comprise one of the world's largest, richest known copper-cobalt resources. They are in the process of being developed into a large scale, long-life mine demonstrating low operating costs.

The deposits have had a long history. They were first explored and evaluated by UMHK from 1918 onwards. From 1970 to 1976 they were held by the Société Minière de Tenke Fungurume (SMTF), an international consortium headed by Charter Consolidated, an affiliate of Anglo American. In partnership with them were Mitsui Mining, Amoco Minerals, BRGM and Paribas.

The consortium dissolved after the 'Kolwezi Incident' of 1976, when a number of Europeans were massacred in Kolwezi after Katangan rebels launched an invasion into the mining region of Katanga from their base in Angola. Possession of the resource reverted to Gécamines, who concluded a joint venture agreement with the Lundin family in Switzerland.

The deposits lie on the northern edge of the Katangan Arc. In common with all the other stratiform copper-cobalt deposits in DRC, the deposits are hosted in two parallel, bedded sedimentary units close to the base of the Mines Group in the Katanga sequence. The mineralization is mainly confined to two sedimentary beds, each varying from 5 to 15 metres

in thickness, on either side of a resistant hard siliceous dolomite bed. Oxidation generally extends 50-100 metres below surface in the Fungurume deposits and 100-150 metres in the Tenke deposits. The total oxide resources (open pitable) are estimated at 126 Mt grading 4.3-5.4% Cu and 0.32% Co. The total sulfide resources (underground mining) are estimated at 103 Mt grading 3.4-4.9% Cu and 0.25% Co. The production objectives are 130,000tpa copper metal.

The Kamoto mine lies within the NE extent of the Katanga Arc. The copper-cobalt minerals hosted on the property are a classic example of sediment-hosted stratiform copper ore system deposits. Two parallel to sub-parallel mineralized zones are separated by a poorly to unmineralized dolomitic unit. The reserves and resources are summarized in the following table.

Table 5: Reserves and Resources of the Kamoto mine

Classification	Ore tons in million	% Cu	% Co
Proven reserves	38.4	3.08	0.38
Probable reserves	6.57	3.34	0.28
Measured resources	34.5	3.16	0.37
Indicated resources	13.2	0.34	
Inferred resources	17.4	3.41	0.32

The average annual production over the 20 year project life is estimated at 109,000 tons of copper and 5,680 tons of cobalt.

The KOV ore deposits are in the extension of the Kamoto deposit. K.O.V. is the initials for Kamoto East-Oliveira-Virgule, an alignment of different copper-cobalt ore deposits. The resources at KOV are estimated at 550 Mt containing 4.59% Cu and 0.3% Co. The deposits are in the hand of Nikanor. Nikanor is owned 50% by BSG Resources Group and the balance by Dan Gertler (20%) and the Gertler family trust (30%). Nikanor has a joint venture with Gécamines (25%).

The estimate total resources that are available for direct mining are 185 Mt at an average grade of 4.85% Cu and 0.54% Co.

The Kolwezi tailings are estimated to contain 112 Mt at 1.49%Cu and 0.32% Co. They are the result of accumulation of rejects by the concentrators having treated the ores of Kingamiambo, Kasobantu and Musonoï. It is foreseen to produce 42,000 tpa of copper and 7,000 tpa of cobalt.

Other tailings have been identified at Kakanda tailings (18 Mt at 1.2% Cu and 0.14% Co), Kambove tailings (36 Mt at 0.89% Cu and 0.19% Co), Shituru and Panda tailings (13 Mt at 1.5% Cu and 0.23% Co).

Table 6: Estimate New Production in a few years time

	Proposed Copper metal production in tons	Proposed Cobalt metal production in tons
Tenke Fungurume	130,000	?

Kamoto	109,000	5,680
KOV	250,000	25,000
Kolwezi tailings	42,000	7,000
Frontier	73,000	?
Ruashi	30,000	2,000
Total	**634,000**	**39,680**

In a few years time, the total copper and cobalt production may reach (table6 and table 8) 784,000 tons of copper,

Zinc and Germanium

The Kipushi mine, discovered in 1899, is one of the oldest mines in Katanga. The mine is located on the border north of Zambia and 30 km from Lubumbashi.

It is believed that the open pit was worked around 1925 but the first production records date from 1927 probably when the mine went underground. Head grades of 15% Cu were common in the early years but as the mine has gone deeper, copper grades have fallen to below 2%. Zinc grades have improved with depth but as the mine was considered a copper mine and zinc an impurity, higher grades of zinc were left in situ. The mine closed in 1993. The mine was placed on care-and-maintenance.

Geologically, Kipushi is a discordant deposit related to a fault (the Kipushi fault). The massive ore is hosted in dolomites and dolomitic shales. The near vertical ore pipe has been explored to a depth of 1,800 m below surface and is still open at depth. Kipushi ore body is similar to Tsumeb (Namibia) and Broken Hill (Zambia).

Table 7: Kipushi Mine Production History Tonnage and Mill Feed Grade

Year	**Mt**	**% Cu**	**% Zn**
1960-1969	19.9	11.97	13.38
1970-1979	10.3	5.69	13.62
1980	1.5	4.56	7.08
1981	1.4	3.85	7.01
1982	1.4	3.34	7.77
1983	1.4	3.25	6.93
1984	1.5	3.48	6.55
1985	1.5	3.47	6.86
1986	1.5	3.21	8.40
1987	1.3	3.24	10.11
1988	1.4	3.08	10.29
1989	1.3	2.65	9.37
1990	1.3	2.26	8.52

1991	1.0	1.89	7.82
1992	0.6	1.75	7.32
1993	0.1	1.85	9.05
Total	**60.0**	**6.78**	**11.03**

Kipushi mine has traditionally produced two main products:

- A copper concentrate which was railed to Lubumbashi for smelting in the Lubumbashi Smelter, built in 1910 and now shut down,
- A zinc concentrate which was railed to Likasi for roasting. The recovered SO2 gas passed to the acid plants and the roasted calcine continued on by rail to Kolwezi for leaching and electrowinning of the zinc.

The assessment of the Kipushi tailings dam reserve is believed to contain about 25 Mt assaying 2.73% Zn and 0.4% Cu.

Total proved reserves between levels 1150 and 1295 are estimated at 4.8 Mt at 2.5% Cu and 21.9% Zn. Probable reserves between levels 1295 and 1500 are estimated at 8.0 Mt at 1.9% Cu and 21.9% Zn.

Another source of zinc is from the Lubumbashi tailings (accumulation of almost 50 years of metallurgical rejects), the Big Hill. It has been estimated that the hill contains 8Mt at 15% Zn.

Finally at Kolwezi, the rejects of the leaching and electrowinning plant has accumulated almost 1 Mt at 20% Zn.

Uranium

The Shinkolobwe ore deposit is rich in uranium ore. It has been first mined for its radium content. Prior to the Second World War, uranium ore was stock piled. These uranium ores were sold to the USA during the war and used for the construction of the first atomic bomb. The mine was officially closed in the early 1960s after the mine flooded. There are been however reports that uranium from the mine has been extracted by artesanal mining and sold since 1965.

Exploration

While the Katanga copper belt is developed and explored to develop new deposits, green field exploration projects, mostly outside the area of the copper belt, are very active. They occur in the Anvil exploration permits around the Dikulushi mine, between the copper belt, to the south, and the border with Zambia, and north of the copper belt.

2.5 Comparison with Other Worldwide Mining Districts

Unlike the porphyry copper deposits of North and South America and of the Pacific, the deposits in Katanga are stratiform in sedimentary rocks which have been considerably folded

and oxidized. In terms of tonnages (reserves and resources) and grades, the Katangan deposits are comparable with other rich copper mining districts in the world. Grades are however much higher in Katanga.

It has been estimated that the total copper metal production until 2003 is about 18 Mt, the cobalt 0.5 Mt, the zinc 3.6 Mt and the germanium 0.28 Mt.

The annual production of copper peaked in 1982 with 542,000 tons. From that year until 2003, the copper production decreased down to about 30,000 tons per year. However with new joint ventures between Gecamines and mining entrepreneurs the production raise is estimated that to reach 150,000 tons of copper and 10,000 tons of cobalt in 2006.

The resources (from table 4) are estimated at 70 Mt of copper, 5 Mt of cobalt and 6 Mt of zinc.

The richest copper resources in the world have been estimated by Crowson (2001) and are given in Table 10:

Table 8: Principal Resources of copper metal in the world

Country	Mt of copper metal
Chili	88
USA	45
Poland	20
Russia	20
Indonesia	19
Peru	19
China	18
Mexico	15
Kazakhstan	14
Zambia	12

From the above table, it can be deduced that DRC is second after Chili.

Surface wise, the Katanga copper belt (30,000km²) is certainly the region in the world with the largest density of copper deposits.

The resources in cobalt of the Katanga copper belt (5 Mt) are by far the largest resources in the world:

Table 9: Principal cobalt resources in the world (Crowson, 2001)

Country	Resources in cobalt metal (in Mt)
Cuba	1000
Australia	680
Zambia	360
New Caledonia	230
Russia	140

The Kipushi zinc and germanium deposit is one of the largest deposits of its type in the world.

3. Diamonds in Kasaï

3.1 Historic

In Kasaï Occidental the first diamond was discovered in 1907, at the Tshiminina river (but the crystal found was only identified in 1909), and in Kasaï Oriental, in 1918, at Lukelenge along the Mbujimayi river. It must be noted that already in 1903, the first diamond was discovered at Mutendele.In 1908 the first kimberlite in the Katanga was identified. In Kasai, the first kimberlite was only discovered in 1946. This discovery was followed by five others, south of Mbuji mayi. In fact, the mining town of Mbujimayi was built on top of a kimberlitic pipe and related diamond-bearing gravels.

Soon after the first discovery the Belgian company la Société Internationale Forestière et Minière du Congo (Forminière) started alluvial mining in the Tshikapa area. Industrial mining by Forminière went on until 1960. It was replaced by a mixed company Minière de Bakwanga (MIBA) where the state controls 80% and Union Minière (now Umicore) controlled 20%, through another subsidiary, Sibeka. Today Umicore has sold his shares in Miba to the South African company Mwana Africa.

Besides alluvial mining, Miba is exploiting diamonds from a kimberlitic pipe near Mbuji-Mayi. In 1982, the diamond trade was liberalized

In 1916, another Belgian company started diamond exploitations: Minière de Bécéka

Artisanal diamonds diggers are everywhere and produced good quality diamonds.

3.2 Brief Summary of the Geology

The two Kasaï provinces are underlain by the Angola-Congo craton, covered by younger Paleozoic and Mesozoic sediments.

The diamonds deposits are of three types: primary (kimberlitic breccias and tuffs), detrital or eluvial and alluvial. Alluvial deposits are concentrated in the “Kasai occidental”, around Tshikapa and eluvial deposits are rather known near the kimberlitic pipes of Mbujimayi.

Kimberlites are well known in Angola near to the border with DRC. They appear to be aligned in a ENE direction. The extension of this belt into DRC corresponds to the presence of new kimberlites recently discovered in DRC, near Mbujimayi.

3.3 The MIBA Structure

La Minière de Bakwanga (Miba) is a mixed company, 80% owned by the Government and 20% owned by Sibeka (Umicore, Belgium). Umicore/Sibeka recently sold its 20% to Mwana Africa, a South African company. MIBA was constituted in 1961.

Four important authorities decide on the fate of Miba: the President Administrator Delegate, mandated by the State, the Vice-President of the Board who represents the other shareholder (Sibeka), the Administrator General Manager (Sibeka) and the Deputy General Manager.

Today Miba holds 1,000 km² of exploitation titles and 70,000 km² of exploration permits. In 1983 the concession area was reduced to 5,000 km² around the industrial mining activities, while all other areas were opened for artisanal mining activities where tens of thousands of artisanal miners now operate.

3.4 Past and Present production, Development and Exploration

Between 1912 and 1969 the Kasaï has produced about 400 million carats. From the 1960's, all the production was sold trough Britmond, a De Beers subsidiary, now defunct. Since 1982 the diamond trade was liberalized and the artisanal production can be sold by official comptoirs (desks). Smuggling of diamonds out of these zones for sale to an informal economy began to flourish. In 1999, the Ministry of Mines cancelled all diamond purchasing permits, banned all foreigners from mining areas and attempted to move the diamond trade to Kinshasa for tighter control. As a result diamond purchases more than halved.

The average ore grade of the alluvial deposits near Tshikapa is 0.9 ct/m³, with about 80% of the diamonds of industrial quality and 20% gemstones. The diamond bearing placers occur generally near river beds and within a few meters from the surface. Reserve estimates for these areas are not available.

The average ore grade of the deposits near Mbuji-Mayi is about 5 ct/m³ in eluvial deposits, with about 95% of diamonds of industrial quality and 5% gemstone. To expose the diamond bearing gravels about 4-12 m³ of overburden have to be removed per m³. The ore grade of the kimberlite pipes is similar; however, the rock is harder.

Reserves in Miba's industrial zone near Mbuji-Mayi are estimated at about 100 million carats, about 50% in alluvial and eluvial deposits and 50% in kimberlite pipes.

Miba is looking for partners to sign joint ventures and exploited alluvial and kimberlite bearing diamonds. Negotiations are taking place. Sengamines was granted the commercial rights to operate a diamond concession at Mbujimayi where it is estimated to have one of the world's largest kimberlitic deposits.

A large portion of Miba concessions is in the hands of small diggers producing more diamonds than the mixed company (see the following tables)

Table 10: Diamonds production, values and exports by MIBA between 1961 and 1999
(Note: data for value and price per carat is missing for years 1961 – 1982)

Year	Million of carats produced and sold	Value (in million US$)	Average price per ct (in US$)
1961	18.0		
1962	14.6		
1963	14.8		
1964	14.7		
1965	12.4		
1966	12.4		
1967	13.1		
1968	11.3		
1969	11.6		

1970	12.4		
1971	12.0		
1972	12.2		
1973	12.0		
1974	13.0		
1975	12.4		
1976	11.5		
1977	10.8		
1978	10.6		
1979	8.1		
1980	8.0		
1981	5.7		
1982	5.6		
1983	5.5	47.8	8.63
1984	6.6	56.7	8.62
1985	6.6	54.1	8.17
1986	7.9	65.0	8.21
1987	7.7	66.4	8.60
1988	8.0	72.4	9.05
1989	8.9	91.8	10.30
1990	9.6	102.6	10.60
1991	7.2	77.0	10.67
1992	4.3	46.3	10.66
1993	4.7	52.2	11.07
1994	4.9	53.3	10.93
1995	5.5	62.7	11.38
1996	6.5	75.9	11.67
1997	6.2	78.1	18.67
1998	6.6	94.0	14.19
1999	4.7		

Table 11: Diamonds Exportations by local diggers between 1983 and 1999

Year	**Carats (in million)**	**Value (in million US$)**	**Average price per ct (in US$)**
1983	6.2	91.5	14.7
1984	11.5	159.8	13.9
1985	13.5	147.4	10.9
1986	15.4	163.9	10.6
1987	11.9	130.9	11.0
1988	9.6	178.4	18.6
1989	8.7	159.0	18.3
1990	9.8	155.1	15.8
1991	10.6	135.2	12.7
1992	9.0	185.1	20.6
1993	10.6	259.7	24.5
1994	11.3	243.2	21.5
1995	16.3	314.8	19.3
1996	15.4	313.0	20.3

1997	15.5	308.0	19.9
1998	19.3	356.8	18.5

A total of 563.2 million carats is estimated to have been produced between 1961 and 1998.

If 10% of these diamonds are gem quality, it means that during this period of time 56 million carats have been produced for jewelry.

It must be noted that, for the years concerned in the above tables, the MIBA production is decreasing and the production of the local diggers is more or less constant. However, the average price per carat obtained by the diggers is higher than the ones produced by Miba. This is due to the fact that the alluvial deposits contain more gem (20%) than the eluvial and kimberlite deposits (5%).

Today all the surfaces not belonging to Miba and representing a potential for diamond discovery have been reserved by several well known companies for intensive exploration. Some new kimberlites have already been discovered but the exploration programs are not yet ready to declare their profitability.

Other known diamond bearing regions in RDC are the provinces of Kivu and the northern part of the Congo.

3.5 Comparison with Other Worldwide Diamond Mining Districts

In terms of world diamond production, the DRC is the second country after Australia (Crowson, 2001)

Table 12: Diamond World Production in the ten first countries, in 1989

Country	**Carat (in million)**	**Gem quality (%)**	**Nearly gem quality (%)**	**Industrial quality (%)**
Australia	30.3	5	40	55
DRC	**25.0**	**5**	**30**	**65**
Botswana	13.2	19	51	30
Russia	10.8	26	44	30
South Africa	9.6	25	37	38
Namibia	1.0	95	0	5
Angola	0.9	70	20	10
CAR	0.5	55	35	10
Brazil	0.5	55	35	10
Venezuela	0.5	29	36	35

According to Crowson (2001), in 1999, the resources in diamonds of DRC represented 26.1% of the world known resources, with 150 million carats, the first country in the world. In terms of gem quality, Botswana is the first producing country directly followed by Russia and DRC.

4. Gold in Ituri, Kivu and Maniema

4.1 Historic

Ituri

Alluvial gold deposits were discovered in NE Congo (Ituri region) in 1895. Industrial exploitation started in 1926 by a Belgian company, Société des Mines d'Or de Kilo-Moto. In 1964, the mining activities were taken over by the Office des Mines d'Or de Kilo-Moto, OKIMO, a state mining enterprise. Other gold deposits in the same region were exploited by Forminière, this continued until independence. Up to 1979, 330 tones of gold were produced, half of this amount from alluvial deposits. 90% of the 330 t or 300t came from the Kilo and Moto districts (a yearly average production of 5.6 tons of gold).

Kivu & Maniema

In the South Kivu and in the north of the Maniéma provinces, alluvial gold was discovered in 1930 at Namoya and Kamituga and then in 1938 more alluvial deposits were discovered at Twangiza. They were exploited by Minières des Grands Lacs (MGL) and, later on, by SOMINKI (Société Minière du Kivu). MGL, following the alluvial gold discovered the primary gold deposit of Twangiza in the 1950s. MGL tested the deposit through 8,200 m of trenching and 12,100 m of adits on seven levels, collecting a total of 17,400 samples. In 1976 Charter Consolidated of London started an exhaustive assessment of the Twangiza gold deposit but due to other commitments they abandoned the project and the country. Then, SOMINKI (28.1% state of Zaïre and 71.9% private shareholders controlled by direct or indirect majority by the Empain-Schneider Group) restarted the exploitation until the end of the 1980s. In 1996 Banro, a Canadian company, signed a convention with Sominki and DRC's government to take over the operations. Unfortunately Banro had to abandon the country for political reasons until the beginning of 2000s. The concessions were handed back to Banro in 2003.

Diamonds are also reported from this region

4.2 Brief Summary of the Geology

NE Congo is entirely made up of Precambrian rocks. The Upper Congo granitoids are flanked by greenstone belts extending from northern Tanzania into the Central African Republic. All gold occurrences within the NE Congo come from these greenstone belts. Some of these zones are narrow belts (less than 10 km wide, 30-60 km long) made up of units which are isoclinally folded along subvertical axial planes and subhorizontal axis. The major types of gold deposits are: placers, eluvial, veins, disseminated and stratabound deposits associated with Banded Iron Formations (BIF). Some of the identified exploitable deposits have a grade of only 6-7 g/t. In most cases, tabular ore zones around the quartz veins can be defined. They range from 5 to 15 m in thickness and may be several hundred meters long.

In the Kilo district, five major types of primary gold deposits have been recognized:

- quartz veins (example the Senzere mine)
- quartz lenses, veins and stockworks associated with NS shear zones
- quartz veins in albitites far from granitoid rocks
- disseminated gold in fine-grained albitite
- disseminated gold in schists enclosing itabirites.

The main gold mines in the Kilo district are:

- Adidi
- D7-Kanga
- Yedi
- Senzere
- N'zebi
- Creek
- Guelley

In the Moto district, most of the deposits are disseminated gold-type.

The main gold deposits are:

- Agbarabo
- Gorumbwa
- Durba
- Pakaka South
- Megi

In the **Maniéma and Kivu** provinces, the gold deposits are hydrothermal vein type and of the stockwerk type impregnating metamorphic schists (Namoya) and black shales (Twangiza), there are also many alluvial and eluvial deposits. The veins dissect metamorphic schists along major faults. The mineralization seems younger than in the Ituri region.

4.3 The Okimo Structure

The Office d'Or de Kilo-Moto (Okimo) is a 100% government-owned company exploiting gold deposits in NE Congo since 1966. Okimo has a board of directors and an executive committee. Okimo's concession covers an area of 83,000 km².

The Moto and Kilo districts are connected by about 200 km of difficult jungle road. Okimo's activities are presently down to almost nothing. Okimo is signing joint venture with international mining companies: Anglogold Ashanti, Moto Gold mining, Mwana Africa, and others.

4.4 Past and Present Production, Development and Exploration

According to the BRGM (Bureau de Recherches Géologiques et Minières, France, 1974), the total amount of gold produced in DRC since 1905 up to 1972 amounted to 470 tons. From 1986 until 2004 (Gold Field Mineral Service) the country had produced about 150 tons of gold.

Kilo and Moto Districts

The two main districts, Kilo and Moto contain rich mines with gold grades from 5 up to 15 g/t. An assessment mission from 1986 gave the following resources and grades of several mines:

Adidi mine: (cut off grade 6g/t)163,643 t at 9.3g/t or 1.5 t
(cut off grade 2g/t) 379,014 t at 6.1g/t
Gorumbwa mines: 50,054 t at 15g/t or 0.7 t
Oxidized rocks (Moto): 1,312,500 t at 8g/t or 10.5 t
D7 Kanga: 2,558,400 t at 24g/t or 61.4 t

Gorumbwa mine has been open since 1955 and is still in operation today.

Other known mineralizations showed extremely high gold grades, for example : Mongeri, 24g/t, Mont Tsi, 5.7 to 13g/t, Senzere, 20g/t, Galaya, 60 to 100g/t, Dila, 64g/t

Gold production in the Kilo and Moto districts reached 8 tons for the year 1940. It declines during Wold War II to increase again and reached 8 tons during 1955. From that year the gold production decreases down to less than 1 to 2-3 tons in the eighties. Gold is produced from placers and from primary deposits containing about 10-15 g/t which are relatively high grade compared with other gold deposit worldwide.

Table 13: Gold production in the Kilo and Moto districts from 1961 to 1985

Year	Total gold production (Kilo + Moto) in t.
1961	4.7
1962	4.4
1963	5.0
1964	5.0
1965	1.0
1966	3.2
1967	3.4
1968	4.0
1969	4.2
1970	4.4
1971	4.0
1972	3.1
1973	3.1
1974	3.5
1976	2.5
1977	1.8
1978	1.8
1979	1.7
1980	0.6
1981	1.3
1982	1.0
1983	0.9
1984	0.6

1985	0.7

Recently Okimo has signed joint venture contracts with several recognized mining companies such as Anglogold Ashanti, Mwana Africa, Moto Goldmines and others.

Moto Goldmines (30% non-dilutable Okimo) announced that their drilling program, in their 2,350 sq.km permit area, has succeeded to estimate their resources in the Moto region at the following amounts:

Total Indicated resources (Mt and g/t)	Total inferred resources (Mt and g/t)	Cut off grade (g/t)
43.4 at 2.7	100.8 at 3.8	1

Many other small gold exploitations (often limited to alluvial gold) exist in NE Congo within the greenstone belts. Among them the N'Gayu greenstone belt has been investigated recently and it is estimated to contain 1.4 tons of gold in primary deposit and an additional 3 tons of gold in the tailings.

Twangiza-Namoya Gold Belt (Kivu-Maniema))

During the colonial time to the end of exploitation of Sominki (circa 1985) almost 75 tons of gold had been produced from the Twangiza-Namoya gold belt from both alluvial and hard rock sources. The major deposits were Namoya (located to the south in the Maniema province), Lugushwa and Kamituga (both located to the centre, in the Kivu province). The last known major deposit in the region is Twangiza (located in the north, also in the Kivu province), although it has never been exploited industrially.

Today (2005) the exploration work performed by Banro has given up to date estimates of the resources present in the Kivu and Maniema provinces (see Table 17).

Table 14: Recent estimation of the major gold deposits in the Kivu and Maniema provinces

Location	**Measured resources (Mt and g/t)**	**Indicated resources (Mt and g/t)**	**Inferred resources (Mt and g/t)**	**Cut off grade (in g/t)**
Twangiza	4.8 at 3.5	16.8 at 2.75	62.3 at 1.93	1
Lugushwa			37 at 2.3	
Namoya		4.6 at 2.97	7.8 at 2.6	1
Kamituga			7.26 at	

The Twangiza deposit is hosted within mudstones, siltstones and greywackes intruded by mafic and feldspathic porphyry sills along the crest of a major anticlinal structure. Gold mineralization is of hydrothermal origin and is associated with sulfides, which occur in quartz-carbonate veins and disseminations throughout the host rocks.

Alluvial gold was first discovered at Lugushwa in the 1920s, although mining of this deposit does not appear to have begun until 1958. Between 1958 and 1996 at least 14 tons of gold

were produced from alluvial sources with a further 0.3 tons of gold being produced from primary sources. The primary gold is quartz vein hosted.

Located in Maniema province and lying approximately 230 km SW of Bukavu, the Namoya alluvial gold deposits were discovered in 1930 and mined between 1931 and 1947. Primary gold was also discovered and underground mining commenced in 1947. Mining ceased in 1961. Total historical production has been estimated at almost 9 tons of gold.

The Kamituga project is situated 100 km SW of Bukavu. Gold was first reported in the region during the early 1920s with the discovery of alluvial gold. Commercial alluvial mining commenced in 1924 and By 1937 hard rock mining had commenced. At the closure of the Kamituga operations in 1996 approximately 46 tons of gold had been produced from alluvial and hard rock mining. The mine was flooded in 1997.

4.5 Comparison with Other Worldwide Gold Mining Districts

The geological context of the Moto and Kilo greenstone belts is very similar to the Abitibi Archean province in Canada. The Abitibi province has a surface area of 60,000 km². The identified resources are estimated to 6,000 tons of gold. In NE Congo the known identified resources are however 500 tons of gold. The grades are however much higher than in other rich gold regions of the world.

In the provinces of Kivu and Maniema the identified resources and grades are favourable for several open pit operations.

5. Other Mineral Potentialities

5.1 Cassiterite, Tantalite and Columbite, and Wolframite

Tin ores, associated with tungsten and columbium-tantalum ores, occur in eastern Congo, more specifically in the Kivu and Katanga provinces. The minerals occur in alluvial deposits as well as in primary pegmatite rocks of Precambrian age. Industrial mining started in 1919 at Manono (Katanga).

The ore grades range from about 0.2-0.5 kg/m³ of cassiterite (oxide of tin) in alluvial deposits to 1.0-1.5 kg/m³ in primary pegmatites. Historically for each ton of tin, an average of about 25 kg of tungsten, 15 kg of columbium and 5 kg of tantalum have been recovered as by-products from the ore. Many of the deposits are small and rarely contain more than about 1000 tons of tin. In total, the economically mineable reserves may be in the order of 50 million m³ of ore, containing about 40,000-50,000 tons of cassiterite.

"Coltan", a mineral rich in tantalum and columbium, was first discovered in the Kivu region in 1910. Coltan is often found together with cassiterite and extracted as a minor by-product. In the 1990s technological advances in manufacturing capacitors for mobile telephones increased the global demand for the mineral. Coltan was mined in Kivu, Maniema and NE Congo. Although the extraction from gravel beds was primitive, thousands of diggers provided the markets in North America and Europe with large tonnage of coltan when the price went up ten-fold, between 1998 and 2003.

5.2 Polymetallics in Bas Congo

The Western Congolese range traverses the DRC along the Atlantic coast; between Kinshasa and Matadi. It is a chain of mountain running from Gabon in the north to Angola in the south. The rocks, mostly limestones and shales, are known to contain small but rich polymetallic deposits and gossans.

In the DRC although the exposure of this chain of mountains is reduced, several copper, lead-zinc and vanadate deposits have been investigated in the past.

The Bamba copper deposit contains 1.2 Mt with 7.63% Cu and 224 g/t silver.

5.3 Oil Shales in the Congo Basin

Exploration for oil and gas began shortly after independence along the 22 km of coast line at the estuary of the Congo River. In 1976 the DRC first produced oil offshore. The oil industry has consistently been an important contributor to the national economy.

Onshore, in the Congo basin, several exploration campaigns during colonial times, including drillings, have intersected numerous indications of bituminous schists. Pilot plant studies were done but the results are not available. Amoco and Petrofina showed interest in continuing exploration but for unclear reasons they never started field work.

5.4 Nickel and PGM

Several occurrences of platinum minerals have been recorded during the gold panning exploration along the rivers of the Kivu province. No systematic exploration has taken place in this area.

Huge ultramafic and mafic bodies are known in several within the DRC

5.5 Coal

At Luena, southeast of Kamina and about 120 km north of Tenke, coal was produced at a rate of 110,000 tons per year. The washed Luena coal has an ash content of about 15% and a heating value of 5900 kcal/kg. It has a relatively high volatile content of 35% and is not suitable for coking. Luena mine started in 1920 as an open-pit. Four seams; varying in thickness from 0.5 to 5 m and interbedded in shales, are being mined. Reserves are about 20 million tons.

Other coal deposits with similar characteristics but much larger reserves are known to exist in Lukuga in northern Katanga, near Lake Tanganyika. An underground mine was operated there in the 1920s by Geomines (Belgium). The coal was used for electricity generation, railroads and cement plants.

5.6 Manganese

Manganese ore has been produced at Kitenge, in western Katanga, on the Angola border. The manganese was mined from a surface deposit with about 14 million tones of ore reserves containing about 25% manganese.

5.7 Pyrochlore

Pyrochlore is a columbium ore. It occurs in carbonatites at Lueshe and Bingo, near Goma, Kivu. Proven ore reserves at Lueshe are about 2 million tones of weathered ore grading 2.2% Cb2O5. At Bingo ore grades are as high as 6% Cb2O5. The ore would be surface mineable and would make Congo an important producer worldwide. However, there is still a technical problem of producing a concentrate of acceptable grade.

6. Artisanal Mining

Artisanal mining in DRC has become a widespread activity of economic importance to the local population. The new mining code has attempted to control this activity but in many other countries this occupation, employing hundreds of thousand local people, remains mostly illegal. Mining companies are facing huge social and environmental problems as a result of this often illicit mining.

In the eighties, artisanal mining was primarily focused on diamonds. The primitive diggings, employing shovels and hand-held screens as the only tools, were concentrated along river

valleys. A standard pattern of organization has developed; the diggers form a team of 3-6 men working in one pit. They do their own washing. The diamonds are then sold to an intermediate dealer who, at the same time, has supplied them in advance with food and temporary lodging and is paid back for these services through a share of the diamond sales.

At the end of the nineties a temporary boom period for artisanal columbo-tantalite ("coltan") ores was witnessed in NE Congo, when the price of tantalum reached new highs.

Today artisanal mining has extended its activity to gold as well as copper and cobalt (in the ore-rich regions of the DRC). The NE Congo as well as the Kivu-Maniema provinces experienced a drastic invasion of "orpailleurs" not only mining the alluvial deposits but also digging holes in the gold-rich quartz veins. Licensed companies are facing huge social problems because these "artisans" are reluctant to leave their only source of revenue. Clashes between them and the mine "policemen" are frequent. Exploration and development programs are often delayed by these illegal activities.

In the last decade the high cobalt price and more recently with the sudden tremendous increase of the copper price Katanga is also experiencing a massive influx of an estimated 100,000 diggers over the rich oxide copper and cobalt minerals exposed at surface. The diggers started with the heterogenite, a black oxide rich in cobalt (10-15% Co). Like in the other parts of the country they usually work in teams, scratching the black mineral from the exposed rocks. They fill bags with 30-50 kgs of hand picked material and sell them to intermediate agents. The hand picked cobalt concentrates are usually transported across the border to Zambia for treatment. When the price of copper doubled and then tripled diggers started to extract malachite (a rich copper oxide mineral) from deposits legally held by mining partners with the Gecamines. One way for the companies to deal with these "diggers" is to encourage them to form some sort of cooperative which will then sell their products to the company. It works sometimes, but many companies are still complaining that they cannot progress with their exploration and development programs. If the bags of hand-picked malachite (often reaching a grade of 30% Cu) are not sold to the legal holder of the deposit they are usually sold to one of the numerous new local furnaces in Lubumbashi, Likasi and Kolwezi.

Annex 3
Mining Taxes and Fiscal Matters

Different Types of Taxes Pertaining to Mining

Les différentes taxes légales et règlementaires prévues par le code et le règlement miniers, sont reprises ci-après :

1. Recettes douanières perçues par l'OFIDA

1.1 A l'importation :

1. Droits de douane :
- en période de recherche, développement du projet et construction de la mine
- en période d'exploitation
- les travaux d'extension
- autres consommables (quelle que soit la phase du projet)
- importation des objets de déménagement appartenant à des expatriés

2. I.C.A. à l'importation

3. Droits de consommation et d'accises

1.2. A l'exportation :

4. Droits de douane :
- exportation des échantillons
- exportation des produits miniers

5. I.C.A. à l'exportation

2. Recettes fiscales, Impôt sur le Chiffre d'Affaires, les recettes sur les rémunérations des travailleurs et les recettes des activités minières à petite échelle perçus par la DGI

2.1 Recettes fiscales

2.1.1 Impôts réels : les impôts réels sont perçus par la DGI, qui les rétrocède aux EAD

6. Impôt foncier
7. Impôt sur les véhicules
8. Impôt sur les superficies des concessions minières et d'hydrocarbures : Permis de Recherches et Permis d'Exploitation

2.1.2 Impôts cédulaires sur les revenus

9. Impôts sur le revenu locatif
10. Les intérêts des emprunts extérieurs en devises
11. Les dividendes et autres revenus assimilés
12. Autres revenus mobiliers
13. Impôt professionnel sur les bénéfices

2.1.3. Impôt sur le Chiffre d'Affaires(ICA)

14. ICA à l'intérieur
15. ICA à l'exportation
16. ICA à l'importation

2.2. Recettes sur les rémunérations des travailleurs

17. Impôt professionnel sur les rémunérations (IPR)
18. Impôt exceptionnel sur les rémunérations des expatriés (IERE)

2.3. Recettes des activités minières à petite échelle

19. Impôt forfaitaire

3. Recettes des redevances et taxes perçues par la DGRAD

20. Redevance minière
21. Taxes et autres redevances

4. Redevances pour la gestion des titres miniers perçues par le CAMI

22. Droits superficiaires
23. Divers frais de dépôt

5. Recettes de l'Administration des Mines : Secrétariat Général, Direction des Mines, Direction de la Géologie, Direction des Investigations, Direction de la protection de l'Environnement Minier, Commissions Techniques (Comité Permanent d'évaluation, Commission Interministériel d'adjudication, Commission interministériel chargé d'approbation des listes pour l'importation des biens, la Cellule Technique de Planification Minière, Le SAESSCAM, les Divisions provinciales.

6. Recettes de l'Administration des Mines : Secrétariat Général, Direction des Mines, Direction de la Géologie, Direction des Investigations, Direction de la protection de l'Environnement Minier, Commissions Techniques (Comité Permanent d'évaluation, Commission Interministériel d'adjudication, Commission interministériel chargé d'approbation des listes pour l'importation des biens, la Cellule Technique de Planification Minière, Le SAESSCAM, les Divisions provinciales.

5.1. Secrétariat Général

24. Enregistrement des dragues extractives
25. Approbation et enregistrement d'hypothèque
26. Agrément des mandataires en mines
27. Agrément des bureaux d'études environnementales
28. Vente des cahiers de charges pour l'attribution des gisements miniers
29. Autorisation de traitement ou de transformation des substances minérales
30. Autorisation de transformation des produits d'exploitation artisanale

5.2. Direction des Mines

5.3. Direction des Investigations

5.4. Direction de la Géologie

5.5. Direction de la Protection de l'Environnement

5.6. La CTCPM
5.7. Le SAESSCAM

5.8. Les commissions ministérielles

5.9. Les Divisions provinciales

7. Recettes du Ministère de la Justice

50. Activités minières illicites
51. Vol ou recel des substances minérales
52. Détournement des substances minérales
53. Achat et vente illicites des substances minérales
54. Détention illicite des substances minérales
55. Transport illicite des substances minérales
56. Violation des règles d'hygiène et de sécurité

8. Recettes perçues par le CEEC

57. Taxe rémunératoire de la valeur expertisée des substances minérales précieuses
58. Taxe à l'exportation des produits miniers

Effective Tax Rate

The Mining Law of 2002 contains explicit taxation provisions which apply to all mining companies. Taken together, these taxes represent an effective rate of taxation of 46%, which places DRC in the upper one-third in terms of tax take for countries with extensive mining sectors.

Calculation of Effective Tax Rate

A common tool used to compare the total taxes and other amounts paid by a mining project is to calculate the "Effective Tax Rate" (ETR). This is calculated as follows:

$$ETR = \frac{\sum_{n=0}^{n} Tn}{\sum_{n=0}^{n} Rn - OCn - Kn}$$

Where:

- T*n* = expected annual taxes and payments to the government
- R*n* = expected annual gross sales revenues of mineral products
- OC*n* = expected annual operating costs
- K*n* = capital expenditures for all phases of project
- *n* = base year measurement of time

Source: James Otto, Craig Andrews, et.al., "Mining Royalties", World Bank, 2006

Evidence of Deficient Practices in Assessment and Collection of Mining Taxes

Royalties on Diamonds. As officially recorded under the Kimberley Process, diamond exports, principally from the artisanal mines in the provinces of Kasai Oriental and Kasai Occidental, were US$615 million in 2005. It is commonly accepted that the Kimberley process captures 70% of Kasai diamonds[59], thus total exports of diamonds are on the order of US$900 million. The royalty payment alone of 4% on precious stones should result in US$25-36 million in taxes. However, it is noted that there is considerable confusion in government statistics regarding diamonds. For 2006, the carats recorded by the three agencies below are significantly different:

- Administration of mines : 28.672.840 carats
- CEEC : 30.000.000 carats
- OCC : 27.924.166 carats

According to a recent study of the Kasai diamond sector commissioned by the Bank within the framework of implementation of the Extractive Industries Transparency Initiative, fraud in the diamond sector includes the following practices:

- Quasi-total absence of a culture which keeps proper records and statistics;
- "Leakages" between registration and final export;
- Civil servants and agents with the National Police (PNC), National Security Agency (ANR), Gouvernorat, the Army, the Mining Committee, the Division des Mines, and SAESSCAM, are cited as extracting illegal "liftings" of production in the form of sacks of ore bearing gravel, resulting in significant non-declared production.

Surface Rents. The Cadastre Minier (CAMI) is responsible for issuance of "mineral rights" exploration and exploitation permits. The surface rents for these "mineral rights" permits are assessed annually based on the number of hectares under permit times the applicable rate per hectare (US$ 0.50 - 080/ha), which fees escalate each year the permit is held. The mining

[59] This is probably an over-estimate, depending on whether the measurement is in terms of carats or value. Because the best stones are hidden and smuggled by the producers (artisanal miners and/or comptoires) the values as declared to the authorities may be only 40-50% of the real value of exported stones.

right holder receives a bill in February of each year for the surface rents due and must pay these fees within 30 days in order to maintain the permit in force. Prior to 2005, the payments were collected and tracked directly into CAMI bank accounts held in two private banks. Subsequently, the payments have been collected and tracked by DGRAD. However, the management systems in place between CAMI, DGRAD, and the BCC do not permit adequate tracking of the manner in which these payments are made and recorded. The following table illustrates effective receipts of surface rents as registered by CAMI and subsequently by DGRAD.

Anticipated versus Actual Receipts of Surface Rents by CAMI and DGRAD, 2003-2007, in US$ millions

YEAR	Anticipated Receipts	Actual Receipts	Rate of Recovery	
			CAMI	DGRAD
2003	1,426,033	1,143,359	80.17 %	
2004	4,327,671	3,795,317	87.69 %	
2005	7,220,599	5,250,053	72.02 %	
2006	14,971,918	6,475,373		43.25 %
2007	25,152,930	5,928,065		23.57 %

Registration Fees. Another example of fraudulent tax practice, the committee which is implementing the Extractive Industries Transparency Initiative in DRC was informed by the Ministry of Justice that several agents had been arrested after having falsified documents on the payment of the registration fees for the opening of a diamond buying office. The head of the office had received the receipt for having paid US$200,000 registration fees to the Bank for the account of the public treasury. However, the investigation revealed that only US$53,000 had been received, the remainder having been divided between those involved in the scam.

Site Rehabilitation Guarantees. All companies holding mineral rights are required to deposit a guarantee to the central Bank to cover the rehabilitation costs of exploration or exploitation sites. The amounts of the guarantee vary according to the nature of the permit held by the company and for the duration of the permit. The details for 2005-2006 are as follows:

- US$ 15 Million – 3,000 exploration permits @ US$ 5,000/each
- US$ 23.2 Million – 384 exploitation permits @ US$ 50,000/each
- US$ 40,000 – 2 mine tails treatment permits @ US$ 20,000/each
- US$ 1.0 million – 50 mineral treatment authorizations @ US$ 20,000/each

The total amount of such guarantees is expected to increase in 2007 to approximately US$60 million. These guarantees have been in force since 2003 for all mineral rights issued by the Mining Cadastre. The invoice pertaining to these guarantees is established by the Ministry of Mines and the DGRAD. The company pays the guarantee at a private bank for the account of the Central Bank. As is the case for other mining sector taxes, no mechanism exists which traces the payment of these guarantees by the companies, to the account of the Central Bank through the private banks. It is reported that these funds are not managed or controlled by any of the state institutions involved including CAMI, Direction of Protection of the Environment, Administration of Mines, DGRAD, the private banks, the central Bank, or the Ministry of Mines.

A la lecture de cette longue liste des taxes énumérées ci-haut et en considérant la fraude et toutes les pratiques maffieuses décriées, il est difficile d'admettre que la République Démocratique du Congo n'ait pu réaliser que 26.660.439,20 USD de recettes minières pour l'exercice 2005.

Fees for diamond buying offices. The fees recorded in 2005 for granted authorizations to establish diamond buying offices is US$278,802.44, though the legal fee for this authorization is US$ 200,000. This discrepancy between legal fees and the amounts recorded is evident for the years 2002, 2003, 2004. Not only should the total amount be a multiple of the legal fee of US$200,000 but in 2005, as in previous years, many more diamond buying offices were registered than would be inferred from the total amount of fees recorded during the year.

Annex 4
The Mining Contracts

List of Partnership Agreements Under Review

[separate pdf file to be attached]

Analysis of the Contracts

Background

From independence to 1995 mineral rights could only be held by the State through various state owned companies such as Gecamines, MIBA, Sominki, or Okimo. In 1994/95, in face of the inability of the state companies to maintain production, the government made the policy decision to allow the companies to enter into partnerships with private companies. The agreement or "convention" entered into by the state company and the private partner put the mineral right at the disposal of the partnership and also specified the investments and internal management of the partnership as well as the modalities of exploration, development, mining and commercialization.[60] Notable contracts entered into during the 1995 - 2000 period include: Gecamines and the Lundin group for the development of the Tenke Fungarume copper deposit, Gecamines and the Forrest-Outokumpo group (GTL-STL) for the processing of scories in Lubumbashi, Gecamines and Anvil Mining (Australia) for the Dikulushi copper deposit, Okimo with Mindev and Barrick for development of gold deposits, Sominki with Banro Resources for the development of polymetalic deposits, and MIBA and Senegamines for diamonds. This was a period of civil war in the country and it is alleged that some of these and other contracts were awarded under opaque and suspect circumstances[61]. Also, given the high political risks at the time, certain of the partnership contracts contain tax exemptions and allowances in favor the private partner. Now that peace has returned, these may be perceived as excessively generous and out of line with international best practice.

Other contracts have been entered into or renegotiated by state owned mining enterprises and private companies since 2001 when most of the country returned to peace. These include, inter alia:

[60] Negotiations were undertaken and, in some cases, conventions signed during this period with the following private foreign companies: Swipco (Swiss), Lundin group (Canada), Cluff Mining (UK), Banro (Canada), Mindev (Belgium-Canada), Barrick gold (Canada), South Atlantic Resources, SAR (Canada), Union Miniere (Belgium), Anvil Mining (Australia), Gencor-Iscor-Broken Hill (South Africa). Source: Lutundula Commission Report, p. 6.

[61] The Lutundula Commission singles out the MIBA-Senegamines contract in this respect, stating that it has evolved on the margins of the law with numerous irregularities. Global Witness cites the case of the conflict of interest involved in the granting of a mineral right for cobalt owned by Gecamines to Congo Cobalt Corporation, a company controlled by Mr. Billy Rautenbach who at the same time was chief executive officer of Gecamines. However, the Lutundula Commission finds that the CoCoCo is functioning normally and in accordance with the law.

Gecamines with:

- Kabambankola Mining Company (KMC), Tremalt ltd, 2001
- Mukondo Mining, 2004, related to KMC
- Tenke Fungurume (Lundin Holdings and Phelps Dodge/Freeport McMoran) TFM-CMAR, renegotiated 2005
- Kingamyambo Musonoi Tailings (KMT), Adastra Mining/First Quantum, 2004
- Kinross-Forrest, KCC-Kamoto, 2005
- Global Enterprises Corporation (GEC), 2005\
- Compagnie Miniere du Sud Katanga (CMSK)-Luiswishi, 2004

MIBA with :

- DeBeers, 2005
- Dan Gertler International (DGI), 2005
- Nizhne-Lensoye, 2005
- BHP-Billiton, in negotiation

Okimo with :

- AngloGoldAshanti, takeover of Kilomoto Mining International assets, 2000

On the Processes Followed

A number of weaknesses can be identified in the manner in which the agreements were negotiated.

There has been a relative **lack of transparency** with respect to the negotiations and approval of some contracts. In the turmoil and confusion of the civil disturbances period this is perhaps understandable, however lack of disclosure leads to public suspicions that contracts have been negotiated in secret to serve special interests. Disclosure of the terms and conditions of these contracts, with possible excising of company confidential data related to personnel or proprietary technology, may help to restore confidence. To the extent that the foreign company is listed on a major stock exchange, material terms and conditions may be disclosed in conformance with the requirements of the exchange.

In most instances **no competitive bidding process** has been followed nor has any rational attempt been made to package the assets so as to maximize their value. An open tender to select the appropriate partner is the preferred approach when conferring mineral rights for deposits which have been well explored and for which substantial geological data exists and/or known production has taken place. This was, in fact, done in the case of the Gecamines-Lundin contract for the development of Tenke Fungurume. But, it was apparently not done in the case of other contracts. However, there is nothing inherently wrong with negotiating on a one-on-one basis with a specific partner. Indeed, this is the more frequently used approach for hard rock minerals by the international industry. This approach can work provided that the government has the technical, financial and legal expertise to negotiate a contract to best protect the State's interest. It is questioned in some cases whether the government negotiating teams possessed the requisite expertise. Also, whether they were rushed to conclude a deal because of the underlaying weak financial position of the company.

In most instances, **no appraisal and valuation was done of the mineral assets** to be granted to the private company. If such an appraisal had been done a divestiture plan could have been prepared to package the assets so as to maximize the value to State. In particular, it appears that the government was too eager to conclude contracts even though an appraisal and valuation had been recommended by the International Mining Consultants in their report of 2003.

It is **difficult to determine whether the government received a fair market value** for the mineral assets. The payments ("pas de porte") which the private companies have paid to the State enterprise for the mineral asset have been frequently criticized in the local and international price as unrealistically low. Also, in some cases, mineral assets were granted to private companies in exchange for debts owed to the private company by the State enterprise. Valuation of mineral assets is difficult and subject to numerous factors including geological risk, price risk, operating and technical risk, and political risk. Given these uncertainties it is difficult and perhaps not very useful to attempt to go back in time and guess "what-might-have-been". There is also considerable mis-understandings regarding the value of *in situ* mineral resources. It is not simply a matter of calculating the reserves and applying an international market price. Mineral resources must be extracted, beneficiated, and processed at great capital investment and operating cost. Thus, simple comparisons of the assumed value of mineral resources in situ which does not take into account these costs and the various risk factors above do not reflect the real market value of the asset.

The size of the mineral resources transferred to private companies may be too large for a single company to rationally exploit given time and financial considerations. This question has been directed particularly towards the very large copper reserves at Tenke Fungurueme which have been given to the Lundin group. However, it should be noted that this partnership was the result of an international tender and the successful bidder was selected on the basis of a development plan which at the time was deemed appropriate. In the interim, this contract has been under a state of force majeure and development has not taken place.

There **has not been a proper review of the legal and financial terms and conditions** of the contracts before their signature. Such reviews were, in fact, underway when authorization to sign some of the contracts was granted by the government before the results of the reviews were known. It is unclear whether such legal and financial reviews have been conducted for other contracts.

<u>On Conformity with the Mine Law of 2002</u>

While the Mining Law requires financial and technical competency in order to grant an exploitation license, in some cases the financial and technical **capabilities of the companies to fully honor their contractual obligations is open to question.** Ideally, a thorough review by the government of the financial and technical bonafides of companies is conducted before entering into negotiations. This does not seem to have occurred. However, for many of the contracts the companies appear to have no problem raising the funds necessary to develop deposits or to hire the technical experts required to supervise the projects. Thus, at this juncture, it is preferable to put the emphasis on monitoring the progress the companies are making in their investments and to ensure compliance with contract obligations.

Various **encumbrances existing on the mineral assets may not have been fully disclosed** and/or plant and equipment**.** There may be competing claims for the same mining rights, as is possibly the case of Iscor (Kumba Resources on Kamoto). As well, various supplier liens and encumbrances may exist on mining rights and/or plant and equipment which are subject of the contract. Finally, in some cases the validation of the mining rights in accordance with the Mining Law of 2002 needs to be ascertained.

<u>On the Terms and Conditions of the Contracts</u>

In all of the contracts the **state enterprise has a minority shareholding position,** generally around 20%. This minority shareholding position is not unusual in terms of international practice. The Mining Law requires that 5% of shares in the exploitation company be reserved for the State. Any additional shareholdings for the State enterprise is negotiated with the

partner. Other countries have found that while State shareholdings in mining companies may be a palliative for political sensitivities they rarely produce significant dividend streams. This is because the minority shareholders do not control dividend policies of the partnership enterprise and, in any event, at least during the initial years of the venture revenues will be directed to reducing debt. Gecamines right to dividends is illusory since it is unlikely that dividends will occur in the early years of the project given debt reimbursement requirements as well as lack of control over dividend policy

Internal governance procedures need to be specified and/or improved in the partnership contracts. There are a number of dispositions which are missing in most of the partnership contracts which, if present, would improve the protection of the minority partner. These relate principally to clauses to protect minority interests, specification of voting procedures and organizational structures, decision making rules, mandates of officers and directors, accounting and financial management procedures and others. These types of dispositions are entirely normal in partnership agreements and can be added without detriment to the overall terms and conditions of the agreement. In particular, it would advantageous to specify certain key actions, such as dissolution of the partnership or cession of mineral right, which would be subject to unanimous decision, so as to protect the minority interest of the State company. It is noted that achieving clarity on these issues through the addition of new dispositions in the contracts could be a condition of the partnership to access international funding.

In the case of many of the contracts, **management and operating agreements are absent**. Generally, these agreements specify the duties of the operator, budgeting and approval processes, the scope and limitations on authority, the percentage and base for remuneration, and other matters pertaining to the internal operation of the partnership. . It is entirely normal in a partnership for the managing partner or operator to be remunerated for services rendered but basis of this remuneration needs to be clearly specified.

Some performance obligations of the partner are specified in the partnership contract, generally submission of a feasibililty study or minimum investment. It is entirely possible that some of the contractors are (or will be) in **default of their performance obligations** which could open the door for renegotiation by Gecamines. This presents the best option legally for Gecamines to renegotiate the terms and conditions or to simply cancel the contract. In this respect, the Bank is providing funding to Gecamines to provide expert legal advice and counsel to monitor compliance with contracts.

Transfer pricing is a concern in some of the contracts, particularly GTL/STL. In the absence of explicit Congolese legislation on transfer pricing one would have to rely on some notion of international best practice. In the specific case of the GTL/STL contract, more detailed reporting requirements could be put into place to ensure that the government is not disadvantaged by Outkumpo's sale of the mineral product.

Environmental liabilities have not been fully evaluated and responsibilities for them not defined. The contracts are not sufficiently clear on the distinction between pre-existing liabilities and those which may occur during the operation of the transferred assets. Best practice normally requires an audit of the pre-existing environmental liabilities prior to conclusion of investment contracts. Also unclear are the responsibilities of the companies to produce environmental impact statements and management plans.

Gecamines remains responsible for the financial liabilities attached to the transferred mineral and producing assets. Normally, some form of compensation or assumption of these liabilities by the companies would be specified in the contracts. In fact, the contracts specify

exactly the opposite: the financial liabilities remain with the Gecamines even though Gecamines may no longer have an asset to produce revenues to meet its financial obligations.

There are significant conflicts of interest in the contracts whereby the partners may also be suppliers and/or vendors of goods and services. Not only does this preclude any form of competitive bidding and prudential procurement procedures it will also attract management and supplier fees as noted above.

Shareholder loans, "carry" of Gecamines shares of the venture, interest rates, and other financial terms and conditions **may pose significant conflicts of interest and be on terms highly unfavorable to Gecamines.** Gecamines generally retains a 17% - 25% share of the joint venture but this share may be subject to a number of financial conditions which are onerous and unclear.

Financial contributions (equity instead of loans) of the private companies to the joint venture are unclear and ambiguous. In fact, the companies appear to commit themselves only to producing a feasibility study. The funding of development work and operations is left vague in the contracts. The mineral assets and productive plant and equipment are reasonably well known. Under normal practice, it would appropriate to require firm commitments for phased investments (e.g., feasibility study, development, and operations) backed up by appropriate performance guarantees. It is noted, however, that many contractors are, in fact, investing in rehabilitation and other activities.

Gecamines may not be able to recover its mineral right in case of dissolution of the joint venture. It would have been preferable to "lease" the mineral assets rather than transfer them into the name of the joint venture.

Annex 5
Mineral Rights Issued by CAMI

SITUATION DES DROITS MINIERS OCTROYES PAR LE CAMI AU 10 JUILLET 2007

No	Province	AECP	ARPC	PEPM	PR	PE	Total
1	Kinshasa		10				**10**
2	Bandundu				207	2	**209**
3	Kasai Oriental		6		339	116	**461**
4	Kasai Occidental	9	2	43	396	68	**518**
5	Maniema			2	59	16	**77**
6	Nord Kivu				71	11	**82**
7	Sud Kivu				36	35	**71**
8	Equateur				18	18	**36**
9	Bas-Congo	5	119	2	95		**221**
10	Province Orientale			4	258	46	**308**
11	Katanga	13	30	4	1151	82 +2PER	**1.282**
Total		**27**	**167**	**55**	**2.630**	**396**	**3.275**

Au 10 Juillet 2007, on distingue sur un total de 3.275 titres miniers octroyés par le CAMI :

- **2.630 Permis de Recherches**
- **394 Permis d'Exploitation**
- **167 Autorisations de Recherches des Produits de Carrières**
- **55 Permis d'Exploitation de Petite Mine**
- **27 Autorisations d'Exploitation des Carrières Permanentes**
- **2 Permis d'Exploitation des Rejets**

A. Les entreprises paraétatiques sont détentrices de **107 Permis de Recherches**, **305 Permis d'Exploitation** (compris les 49 de l'OKIMO non encore reconfirmés)**, 2 Permis d'Exploitation des rejets, 1 Autorisation d'Exploitation des Carrières Permanentes** et **1 Autorisation de Recherche des Produits de Carrières** répartis comme suit :

1. **MIBA** : - **65 Permis de Recherches** localisés au Kasaï – Oriental
   - **151 Permis d'Exploitation** dont 116 au Kasaï – Oriental (8 au nom de SENGAMINES) et 35 Permis d'Exploitation pour le Kasaï – Occidental

2. **SAKIMA : 40 Permis d'Exploitation** dont :
   - 10 au Nord - Kivu

- 30 au Sud - Kivu. Parmi les 30 Permis d'Exploitation, 10 ont été cédés aux partenariats suivants :

- LUGUSHWA MINING SARL : 3
- NAMOYA MINING SARL : 1
- TWANGISA MINING SARL : 6

3. **GECAMINES** : - **1 Autorisation de Recherches des Produits de Carrière**
   - **1 Autorisation d'Exploitation des Carrières Permanentes**
   - **42 Permis de Recherches** dont 3 cédés à CMSK
   - **59 Permis d'Exploitation** dont 20 cédés aux partenariats repris ci-après.
   - **2 Permis d'Exploitation de Rejets** dont 1 PER cédé à KMT

Les partenariats suivants ont acquis les titres miniers de la GECAMINES :

1. COMILU (Compagnie Minière de Luisha) : 1 PE
2. COMIDE (Congolaise des Mines et de Développement) : 3 PE
3. CMSK (Compagnie Minière du Sud Katanga) : - 3 PE
   - 3 PR
4. BOSS MINING: 2 PE
5. KMT (Kingamiambo Musonoi Tailings): 1 PER
6. MM (Mukondo Mining), Ex KMT : 2 PE
7. KALUMINES(Kasonta – Lupoto Mines) : 1 PE
8. MKM SPRL(Minière de Kalumbwe Myunga) : 1 PE
9. MIKA (Société Minière de Kasombo) : 1 PE
10. MUMI (Mutanda ya Mukonkota Mining): 1 PE
11. SEK (Société d'Exploitation de Kipoi): 1 PE
12. SMCO (Shituru Mining Corporation): 1 PE
13. SMMK (Société minière de Kabolela et de Kipese) : 2 PE
14. SWAMINES (Société d'exploitation des gisements de Kalukundi) : 1 PE

4. **SODIMICO** est détentrice de **5** Permis d'Exploitation dont quatre cédés aux partenariats suivants :
   - MMK SARL : **3** Permis d'Exploitation + **4** Permis de Recherches
   - COLMET
   - FIRST QUANTUM MINERALS
   - AMERCOZA devenu MWANA AFRICA

5. **KISENGE MANGANESE** est détentrice de **1** Permis d'Exploitation

6. **OKIMO** : cette entreprise est détentrice de **49** Permis d'Exploitation acquis avant le nouveau code minier et pour lesquels la mise en conformité n'a pas encore était faite à ce jour.

B. Les entreprises paraétatiques ont cédé **1 Permis d'Exploitation des rejets** sur les deux (GECAMINES), **3 Permis de Recherches**(GECAMINES) sur 107 permis de Recherches et **28 Permis d'Exploitation** sur le total de 305 Permis d'Exploitation(GECAMINES :18 , SAKIMA : 10)**.**

C. Dans l'ensemble, la situation d'octroi des titres miniers se résume comme suit :

1. **Un** Permis d'Exploitation de Rejets cédé sur les **deux** octroyés par le CAMI (50%)
2. **Trois** Permis de Recherches cédés sur les **107** appartenant aux entreprises paraétatiques(0,30%) sur un total de **2.630 Permis de Recherches** octroyés par le CAMI.
3. **Vingt-huit** Permis d'Exploitation sur les **305**appartenant aux entreprises paraétatiques (10%)sur un total de **394 Permis d'Exploitation** octroyés par le CAMI.

Annex 6
Report on Artisanal Mining

[separate pdf file to be attached]

Annex 7

Report of the German Federal Institute for Geosciences

[separate pdf file to be attached]

Annex 8

Major Related Road Projects Financed by the Bank and/or other Agencies

The World Bank

Project Name/ID	Implementation date	Closing date	Total Cost (US$millions)	Description	Road component cost (US$millions)	Roads names	Length (Km)	Works
EMRRP (P057296) Emergency Multisector Rehabilitation and Reconstruction Project	2005	2008	$454.00	Transport, roads, electricity and water, urban infrastructure, Health, Social protection	$152.77	Mpozo-Sonabata Bridge	261	Rehabilitatic of paved roads
						Kenge-Kikwit-Batshamba	346	Rehabilitatic of paved roads
						Batshamba-Tshikapa	258	Opening up of unpaved roads
						Kananga-MbujiMayi	183	Opening up of unpaved roads
						MbujiMayi-Mweneditu	158	Maintenance of paved roads
						Nguba-Lubumbashi	184	Rehabilitatic of paved roads
PUSPRES (P081850) Emergency Economic and Social Reunification Support Project	2003	2008	$214.00	Rehabilitation of priority infrastructure of transport, rehabilitation of urban functions in 4 major cities and 8 urban centers, support to based communities, Ministry of Finance, Institutional Strrnghtening	$93.34	Mbujimayi-Kasongo-Bukavu	1020	Opening up of unpaved roads
						Kisangani-Niania-Beni	751	Opening up of unpaved roads
						Port de Matadi-Pont Mpozo	8	Rehabilitatic of paved roads
PUAACV (P088619) Emergency Living Conditions	2005	2010	$82.00	Support to medium size cities, rehabilitation of administrative	$33.44	Lubumbashi-Kasomeno-Kasenga	208	Opening up of unpaved roads
						Akula-Gemena-	168	Opening up of unpaved

Improvement Support Project				centers of provinces, opening up of roads and institutional strenghtening of provinces		Mbari		roads
						Mbari-Libenge et Boyabo-Zongo	224	Opening up of unpaved roads
PURUS (P104497) Emergency Urban and Social Rehabilitation Project	Apr-07	2011	$182.00	Building schools, payment of internal debt, rehabilitation of public roads, water, health	$42.00	Réhabilitation de la voirie urbaine de Kinshasa	34	Rehabilitatic of paved public roads

Other Agencies

EU

PAR II Rehabilitation Support Program: Initial Agreement (80 millions euros), Amendment n°1 (28,65 millions euros) and Amendment n°2 (22 millions euros)	Jul-03	Dec-12	130.65 €	Rehabilitation of roads infrastructures and adduction of clean water, building operational capacities of OdR, of OVD and Regideso	100.05 €	Kinshasa-Kenge	275	Preservation of RN1
						Lufimi-Kwango	57	Rehabilitation of paved roads
						Mongata-Bandundu-Mpoko	281	Opening up of unpaved roads
						RN1-Mpoko-Bandundu-Weti-Mbandaka	809	Opening up of unpaved roads
East Congo Program (PEC) Program of Rehabilitation and Reinsertion after war in the Eastern Provinces in DRC	Aug-06	Dec-11	65.00 €	Rehabilitation of roads infrastructure	33.00 €	Uvira-Kamanyola	85	Maintenance of covered roads
						Kamanyola-Bukavu-Goma-Beni-Kasindi	759	Opening up of unpaved roads
						Rutshuru-Bunagana	24	Opening up of unpaved roads
						Kisangani-Lubutu	204	Re-openeing of paved roads
						Sake-Walikale	287	Maintenance of unpaved roads

AfDB

Rehabilitation of Nsele-Lufimi and	Dec-05	Jan-10	$76.57	Rehabilitation of Nsele-Lufimi et	$76.57	Nsele-Lufimi	95	Rehabilitation of paved roads

Kwango-Kenge roads Project				Kwango-Kenge roads-Study on the planned Loange-Mbuji Mayi road construction		Kwango-Kenge	73	Rehabilitation of paved roads

Koweit

Rehabilitation of Libération Avenue in Kinshasa	Dec-06	Dec-09	$15.00	Opening up of Selembao District and restoration of the direct link between thw west and the center of Kinshasa	$15.00	Round about Mandela-UPN Bridge	13	Rehabilitation of paved roads

DFID

Rehabilitation of Road K2 Project	2004	Nov-07	$7.00	Rehabilitation of the road Kisangani-Ubundu by the HIMO method	$7.00	Kisangani-Ubundu	129	Opening up of unpaved roads

Belgium

Emergency program for DRC 2006-2008	Aug-06	Oct-08	25.00 €	Improve access to water, sanitation of priority zones and opening up of these zones in major cities	11.00 €	Rehabilitation and Sanitation of Kinshasa public roads		Rehabilitation of paved roads
						Boma -Tshela	117	Rehabilitation of paved roads
						Rehabilitation of Office des Routes ferry boats		Rehabilitation and construction

Road Infrastructure Analysis

Province	Background	Points served	Financing
Katanga	Lack of roads in Katanga have been identified by various investor companies as a major impediment to development of minerals. These enterprises have started to construct their own roads to service their immediate requirements, as for instance to the border posts in Zambia.	Paved : • Lubumbashi-Likasi-Kolwezi Gravel : • Lubumbashi-Kasenga • Mokambo to Tenke • Kasenga to Kilwa to Pweto Kalemie and Moba • Lubumbashi to Mokambo to Sakania	World Bank World Bank
Kasai Occidentale	A critical issue in addition to road transport is rehabililtation of the rail links between Mbuji-Mayi and Lubumbashi	Gravel : • Mbuji-Mayi to Kabinda to Lubao to Kasongo • Mbuji Mayi to Kananga • Lodja to Lomela to Ikela and Boende	World bank
Kasai Orientale	Some private diamond companies are constructing their own roads, as is the case of AMB	Gravel : • Kananga to Mbuji-Mayi • Tshikapa to Gungu • Tshikapa to Kananga • Kananga to Lodja	World Bank
Bandundu	Some diamond companies are constructing their own roads, as is the case with MIDAMINES	Paved : • Gungu to Kikwit • Kikwit to Masimanimbto Kenge • Kenge to Kinshasa Gravel: • Masimanimba to Bagata to Bandundu • Bandundu ville to Mbankane • Kenge to Popokabaka to Kasongo to Lunda	World Bank African Development Bank European Commission World Bank

Bas Congo	Lack of roads is a major development constraint for this province, even though it is not a key minerals producer	Paved: • Matadi to Mbanza to Ngungu to Madimba • Madimba to Kinshasa • Matadi to Inga to Boma to Tshela Gravel: • Boma to Moanda to Mbanza to Ngungu to Luozi to Tshela	World Bank European Commission World Bank World Bank
Equateur		Gravel: • Gemena to Kananga to Zongo • Gemena to Businga • Lisala to Bumba • Bumba to Aketi • Mbandaka to Bikoro to Bokatola • Zongo to Mogalo • Bokatola to Ingende to Boende to Ikela to Opala to Kisangani	World Bank DFID European Commission World Bank
Oriental Province		Gravel : • Kisangani to Bafwasende to Nia Nia to Mambasa to Comanda • Aketi to Buta to Banalia to Kisangani • Kisangani to Ubundu • Beni to Komanda to Bunia • Kisangani to Lubutu to Oso to Walikale • Lubutu to Punia • Nia Nia to Wamba to Isiro to Niagara to Dungu to Aba • Bunia to Djugu toAru to Mahagi • Ikela to Opala	World Bank DFID European Comisión KFW World Bank

		toKisangani	
Maniema		Paved: • Kindu to Kalima Gravel: • Kindu to Punia • Kindu to Kasongo	World Bank World Bank
Nord Kivu		Gravel: • Walikale to Masisi to Goma • Walikale to Hombo • Bukavu to Goma • Rutshuru to Lubero to Beni	European Commission World Bank
South Kivu		Paved: • Hombo to Bukavu Gravel: • Kasongo to Mwenge to Walungu to Bukavu • Kasongo to Kindu • Kalemie to Fizi to Uvira	

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